


Response to Article “Microfluidic Synthesis of miR-200c-3p Lipid Nanoparticles: Targeting ZEB2 to Alleviate Chondrocyte Damage in Osteoarthritis” [Letter]

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Dear editor

We recently read with great interest the article “Microfluidic Synthesis of miR-200c-3p Lipid Nanoparticles: Targeting ZEB2 to Alleviate Chondrocyte Damage in Osteoarthritis” by Zheng et al,¹ published in your journal. This study presents an innovative approach to treating osteoarthritis (OA) using miR-200c-3p lipid nanoparticles (Lipo-AgPEI-miR-200c-3p) synthesized via microfluidic technology to target ZEB2 and mitigate chondrocyte damage.

The research successfully constructs a novel drug delivery system with Lipo-AgPEI-miR-200c-3p, which not only enhances the delivery efficiency of miR-200c-3p but also significantly reduces material cytotoxicity.² This is crucial for the potential clinical application of miRNA in OA treatment. The study also confirms that miR-200c-3p targets ZEB2, regulating the inflammatory response, apoptosis, and matrix degradation of chondrocytes, revealing a key role in OA development and providing a new molecular target for therapy.³

However, the study has some limitations. Firstly, it lacks in vivo model validation. While the in vitro results are promising, the therapeutic effects and safety of Lipo-AgPEI-miR-200c-3p need to be verified in animal models to better understand its potential in a more complex biological environment. Secondly, the research does not sufficiently address the long-term efficacy and safety of the nanoparticles. Long-term stability and potential side effects are critical for clinical translation, and further studies are needed to evaluate these aspects. Lastly, the study could benefit from a broader consideration of the diverse pathological mechanisms of OA, such as oxidative stress and cellular senescence, to provide a more comprehensive therapeutic strategy.⁴

In conclusion, the work by Zheng et al offers valuable insights into the development of nano-drug delivery systems for OA. However, to fully realize the clinical potential of Lipo-AgPEI-miR-200c-3p, future research should focus on in vivo efficacy and safety assessments, as well as a more comprehensive understanding of its impact on the multifaceted pathological processes of OA.

Thank you for considering our comments.

Funding

There is no funding to report.

Disclosure

No potential conflicts of interest relevant to this article were reported.

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