

Gels based on natural polymers containing silver nanoprisms for combined chemo/phototherapy of cancer

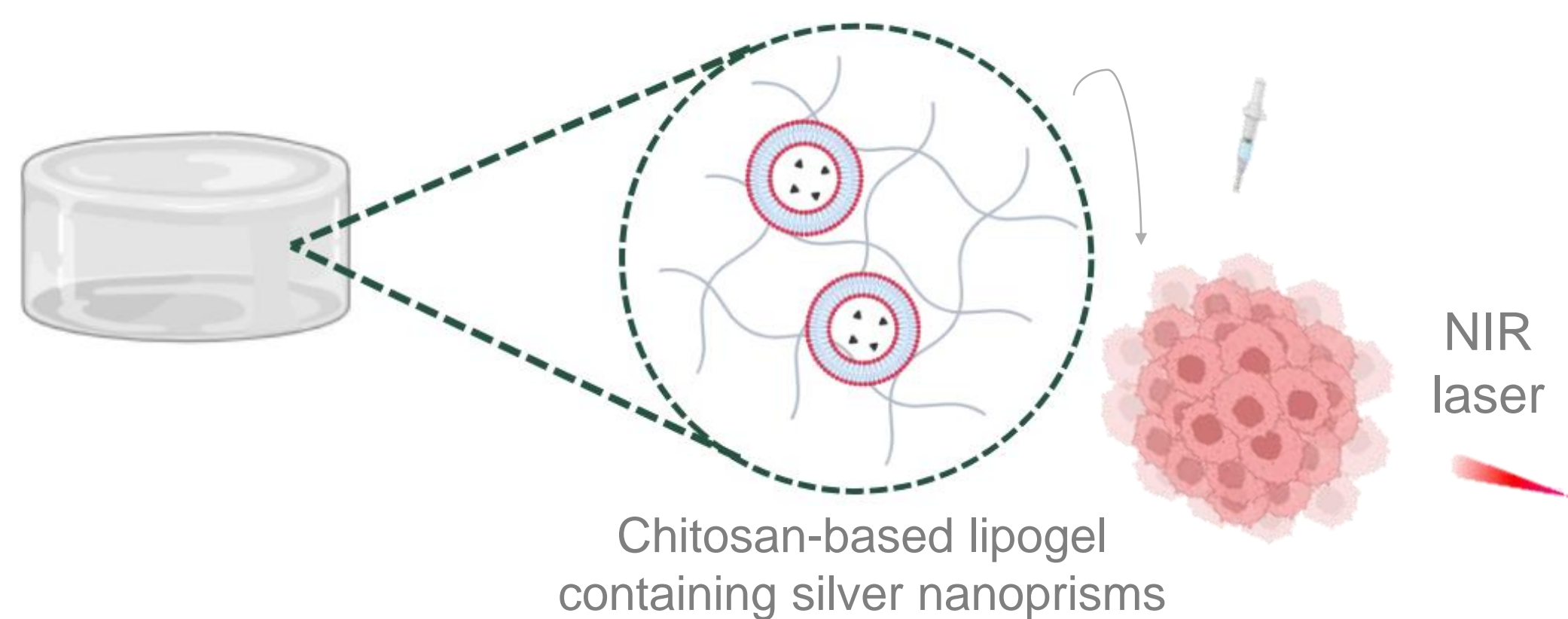
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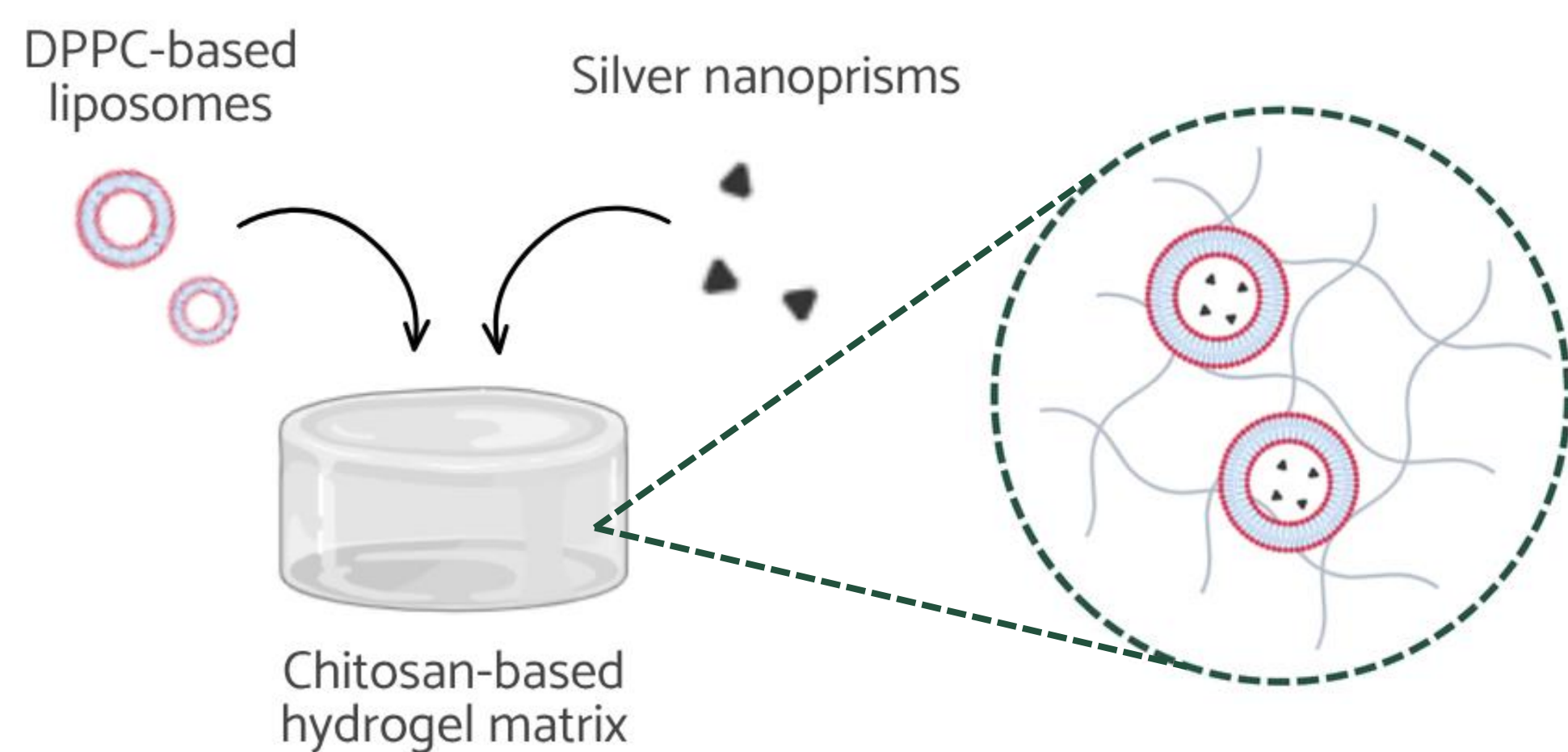
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INTRODUCTION & AIM

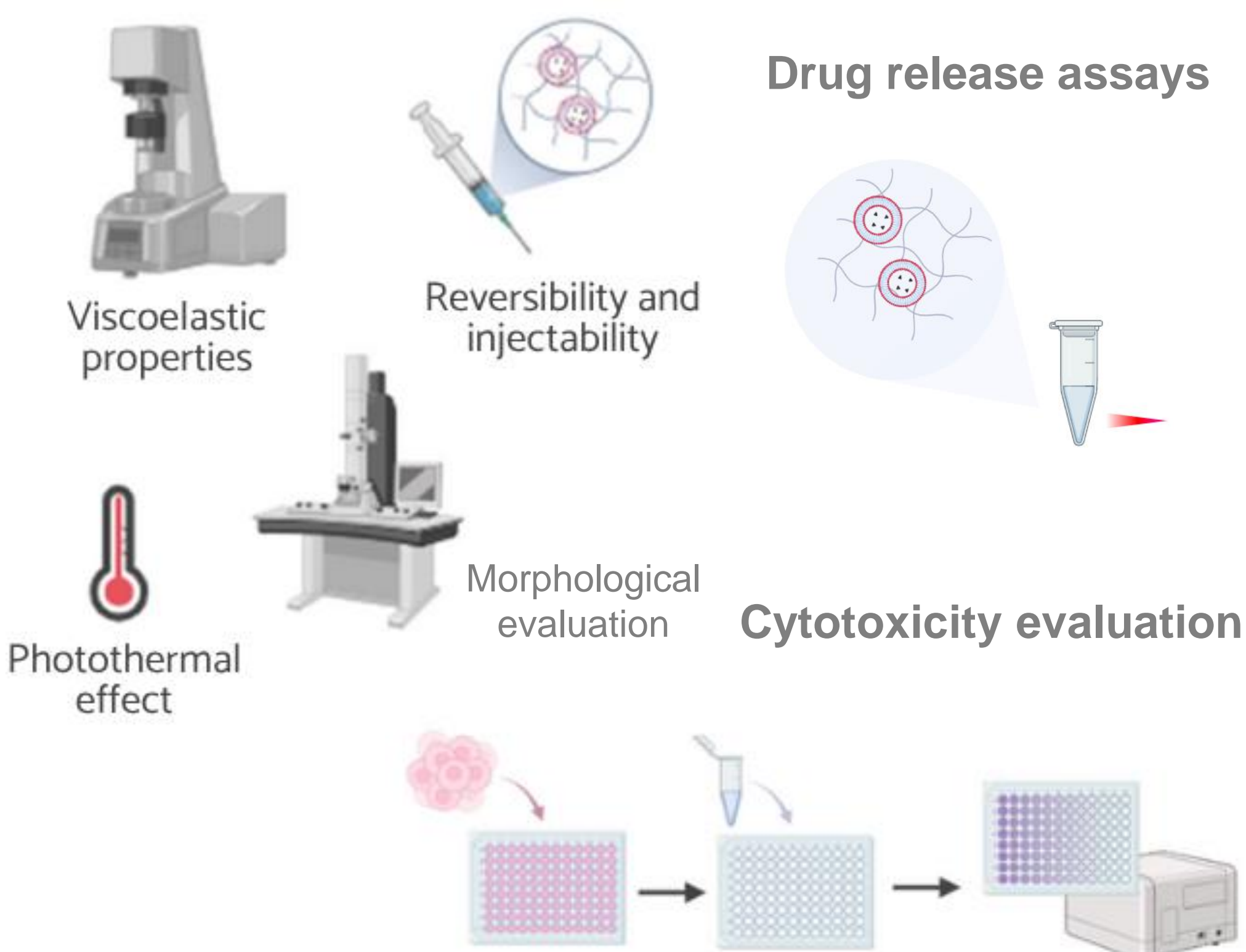


Gel **biocompatible**, **biodegradable**, and **multifunctional**
Tunability of gel properties
Localized, controlled, and stimuli-responsive drug delivery

METHOD



System's characterization



RESULTS & DISCUSSION

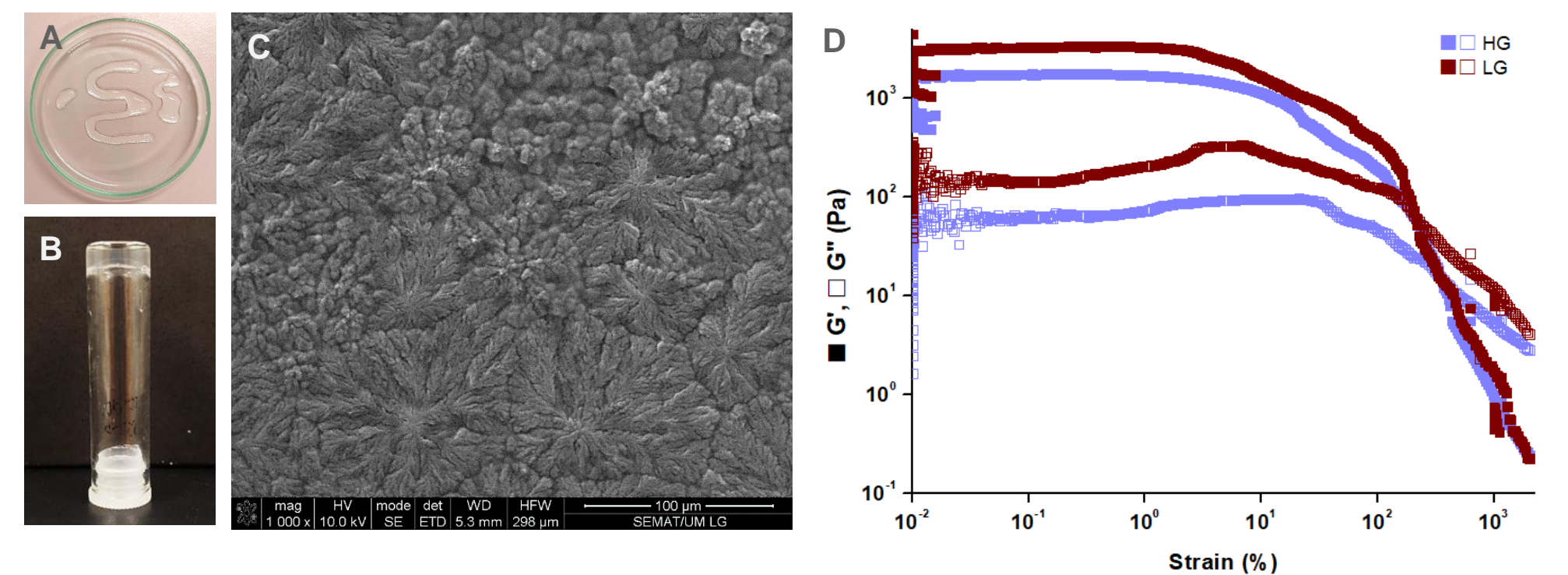


Figure 1. (A) Injectability test of the hydrogel. (B) Tube inversion test and (C) SEM image of the plasmonic lipogel. (D) Amplitude sweep for the hydrogel and the plasmonic lipogel.

Studies on gelation conditions, reversibility and injectability demonstrated the formation of a **stable porous gel** with **promising viscoelastic properties**.

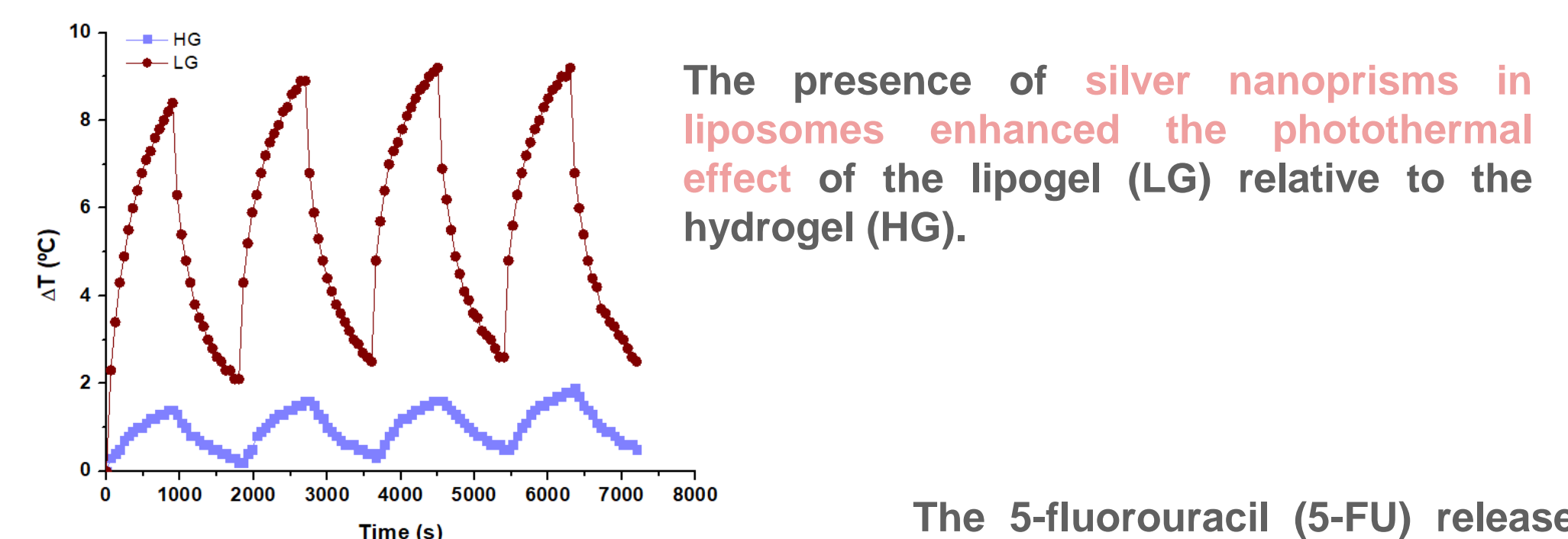


Figure 2. Photothermal effect of the HG and the LG under laser irradiation.

The 5-fluorouracil (5-FU) release was enhanced in **neutral medium**.

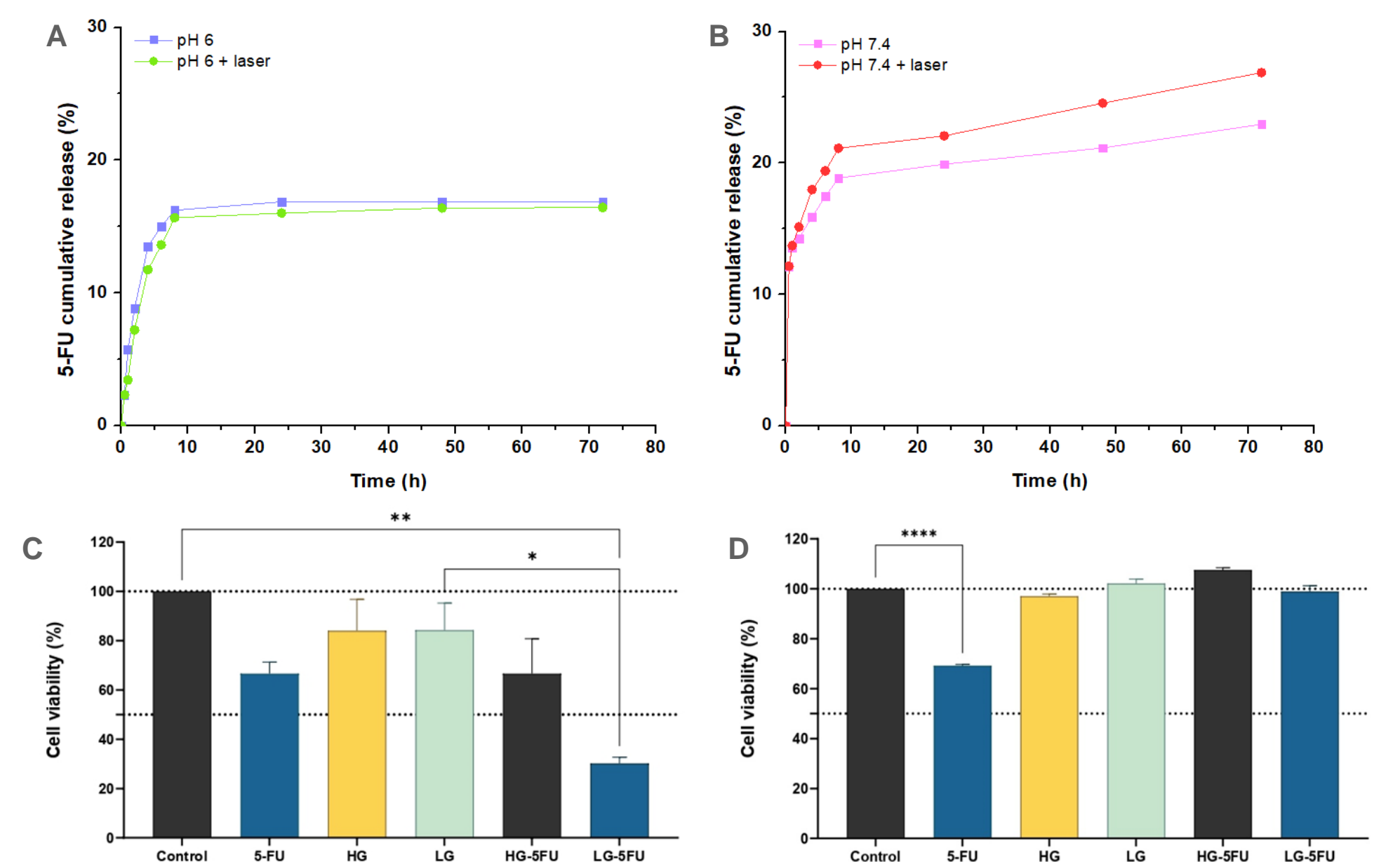


Figure 3. 5-FU release profiles from the LG at (A) pH 6 and (B) pH 7.4. Assessment of the viability of (C) MDA-MB-231 cells (* $p \leq 0.05$, ** $p \leq 0.01$) and (D) BJ-5ta non-tumor cells (**** $p \leq 0.0001$) after 48 h exposure to unloaded and drug-loaded nanoplateforms

In **BJ-5ta fibroblast cells**, both unloaded and 5-FU loaded gels exhibited **no cytotoxic effects**.

In **MDA-MB-231 triple-negative breast cancer cell line**, unloaded gels maintained cell viability above 80%, while the free drug and the loaded HG reduced viability below 70%. **5-FU-loaded LG decreased tumor cell viability to 30%.**

CONCLUSION

- ✓ In this study, a novel plasmonic chitosan-based lipogel was developed, optimized and investigated as a potential drug delivery system;
- ✓ The **structural, mechanical and functional properties**, together with its **in vitro performance**, demonstrated **strong potential as a platform for controlled drug delivery**.

FUTURE WORK

Future work should focus on optimizing the formulation parameters, in order to fine-tune the mechanical properties, stability and drug release kinetics, and investigate the effect on the gel swelling capacity.

ACKNOWLEDGEMENTS

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