

Two to Tango: Chemotherapy “speed-dating” for Cannabidiol in Lipid Nanocapsules against Glioblastoma

POSTER No.
153

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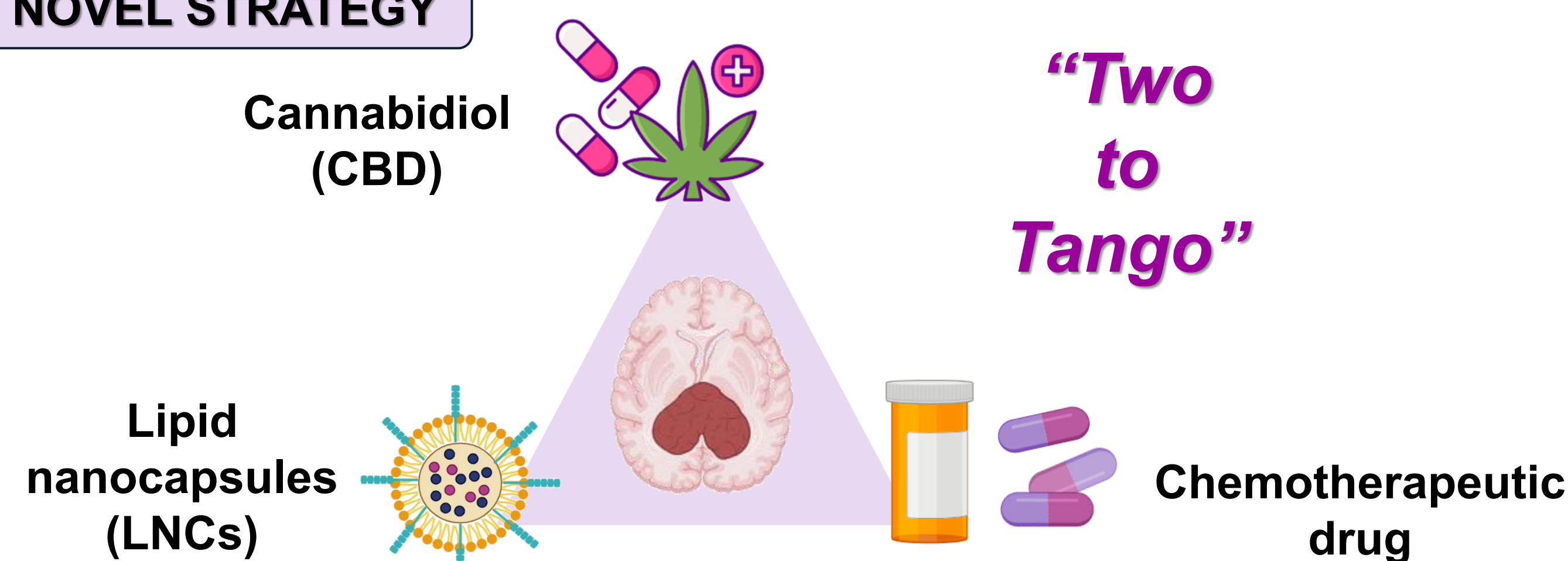
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INTRODUCTION

Glioblastoma: CURRENT APPROACH



NOVEL STRATEGY



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METHODOLOGY

Two to Tango: An *in vitro* cytotoxic screening assay

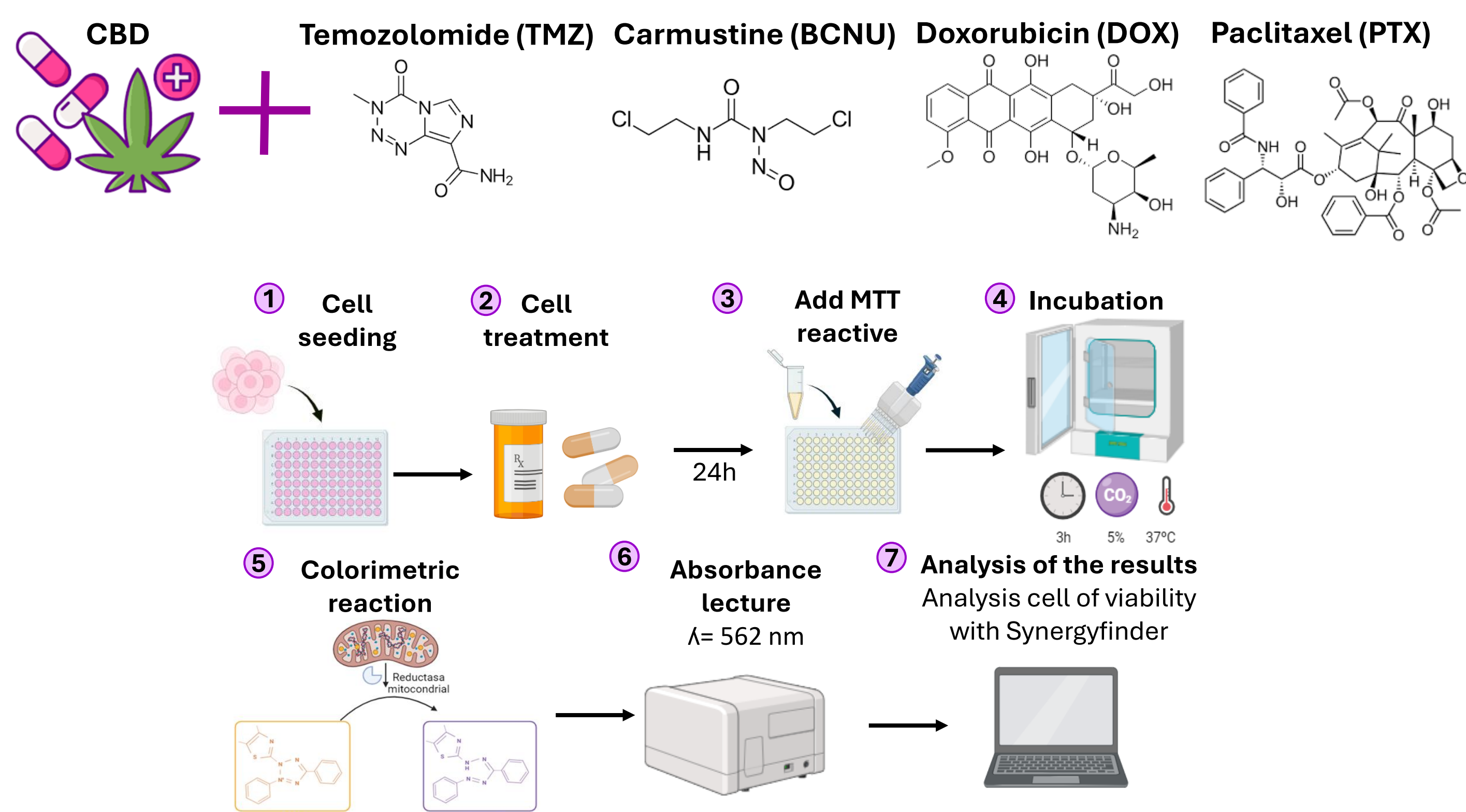


Figure 1. Schematic representation of the MTT test for 2D *in vitro* cell viability assay in U-87-MG glioma cell line.

One carrier to deliver them both: LNCs Formulation

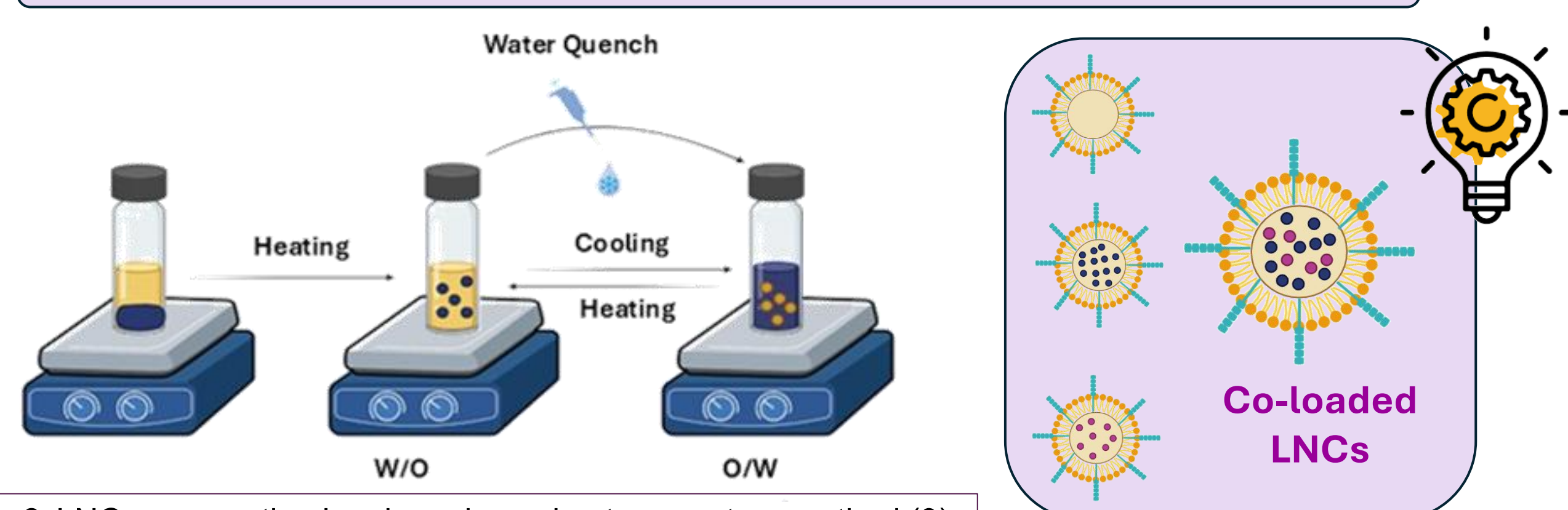


Figure 2. LNCs preparation by phase inversion temperature method (3).

In Ovo Screening: A Step Toward Translational Relevance

A) HET-CAM Angiogenesis Assay

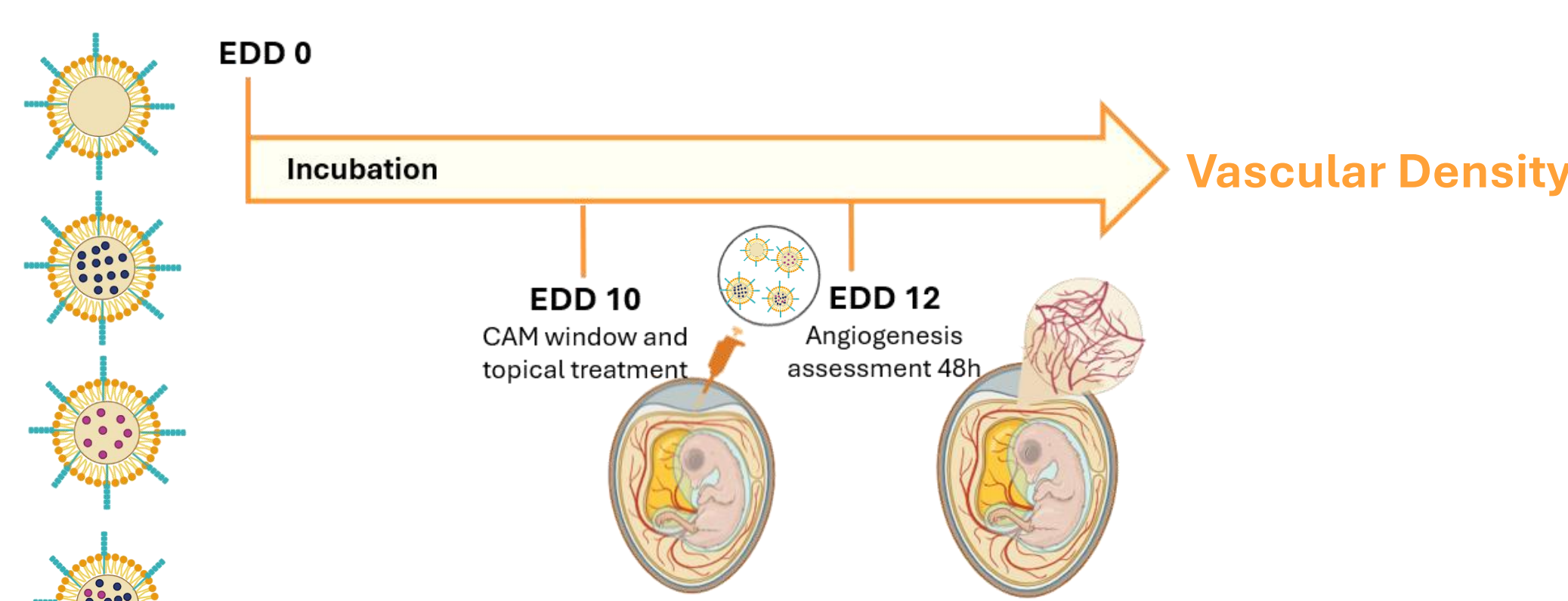


Figure 3. Scheme of the angiogenesis test with the HET-CAM model (4).

B) Tumor Growth Inhibition in the HET-CAM Model

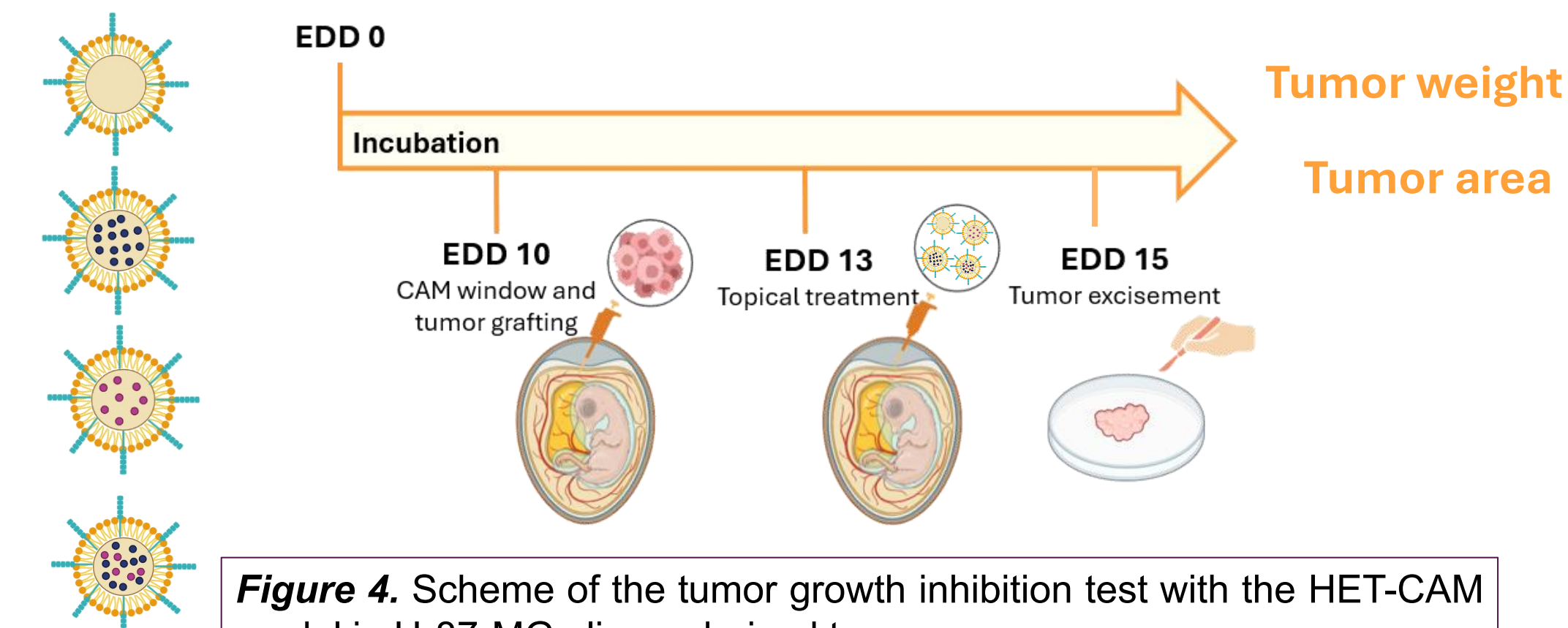


Figure 4. Scheme of the tumor growth inhibition test with the HET-CAM model in U-87-MG glioma derived tumours.

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RESULTS

Two to Tango: Finding the Perfect Therapeutic Match

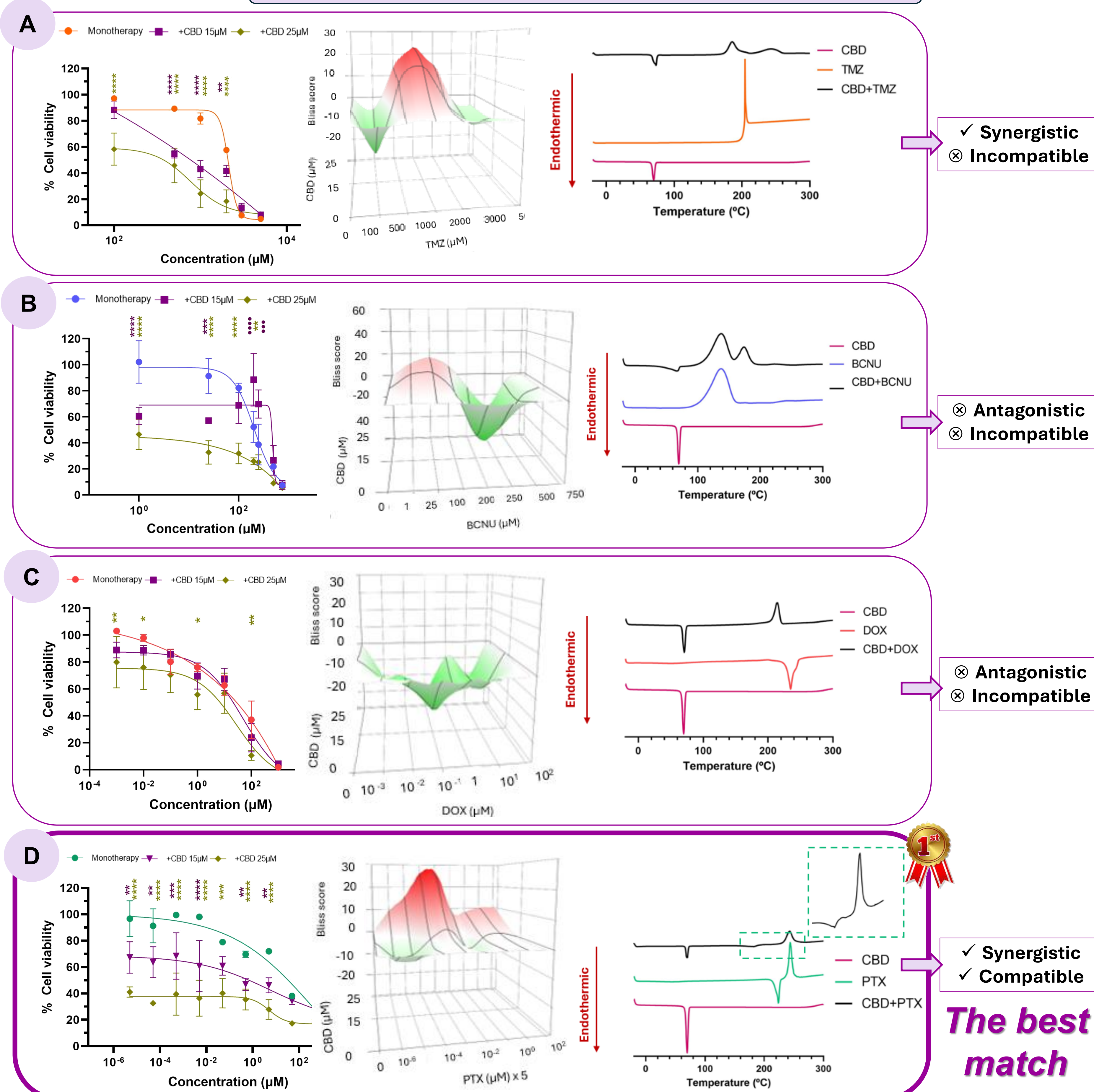


Figure 5. Evaluation of the cytotoxic effect on the human glioma U-87-MG cell line and the chemical compatibility of the CBD combined with TMZ (A), BCNU (B), DOX (C) and PTX (D).

Two to Tango, One to Deliver: LNCs Characterization

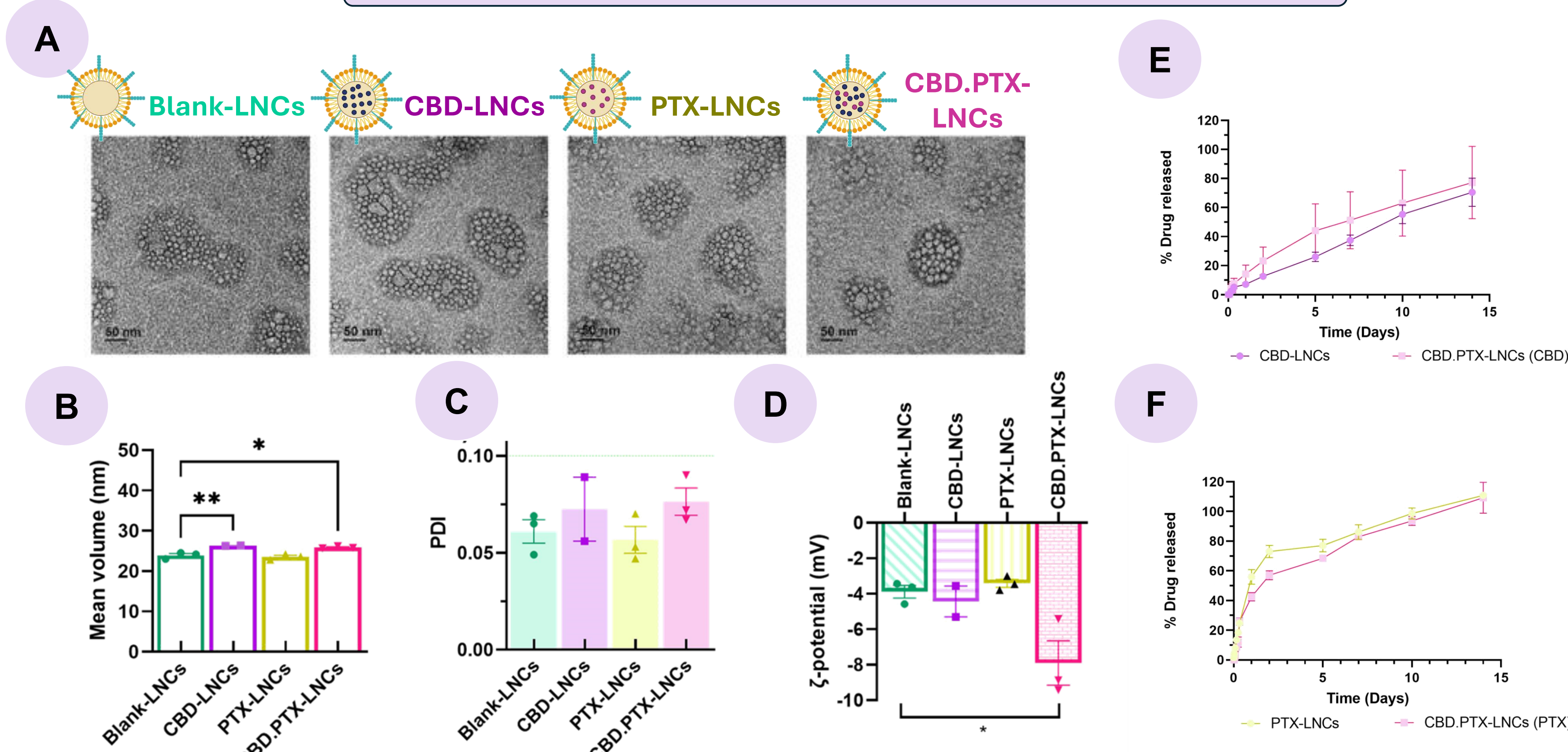


Figure 6. Characterization of Blank-LNCs, CBD-LNCs, PTX-LNCs and CBD.PTX-LNCs: a) Representative transmission electron microscopy (TEM) images (magnification: 25 000x); b-c) Volume diameter and PDI of the different LNCs formulations (N=3); d) Z-potential of the different LNCs formulations (N=3). Statistical analysis: one-way ANOVA followed by a *post-hoc* Dunnett multiple comparison test; e, f) Release profiles of CBD (e) and PTX (f) from their respective LNCs in PBS pH 7.4, assessed by dialysis (N=3).

Tango Takes the Stage: *In Ovo* Assessment

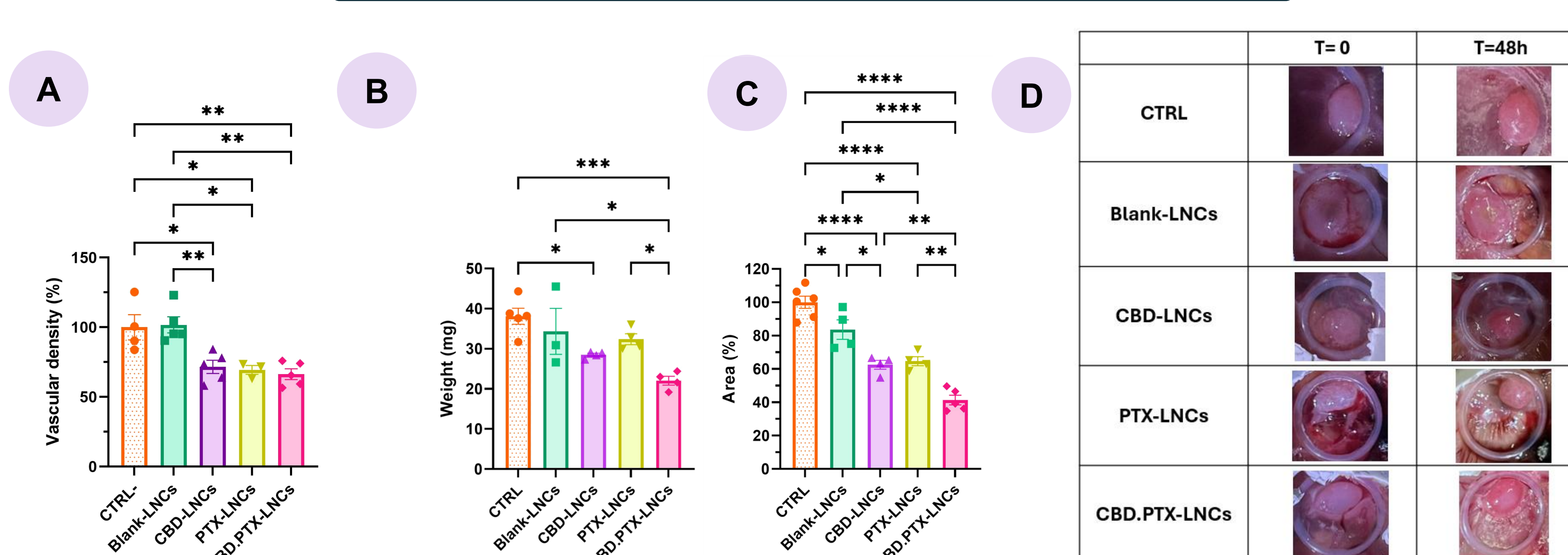


Figure 7. Antiangiogenic and antitumor effect in the HET-CAM model of Blank-LNCs, CBD-LNCs, PTX-LNCs and CBD.PTX-LNCs. a) Vascular density (%) after 48h; b) Tumor weight analysis 48h after treatment; c) Tumor area analysis 48h post-treatment referred to day 0 (day of treatment); d) Images of U-87-MG derived tumor at day 0 and 48h after treatment. Results are expressed as mean \pm SEM (N \geq 4). Statistical analysis: one-way ANOVA followed by a *post-hoc* Tukey multiple comparison. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; ****: $p < 0.0001$.

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ACKNOWLEDGEMENTS

Science, Innovation and Universities Ministry.
Ref. PID2019-105531RB-
I00/AEI/10.13039/501100011033 (NANOGLIO)
Complutense University of Madrid and Santander
Bank (Santander UCM Predoctoral Fellow
CT82/20-CT83/20).

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CONCLUSIONS

CBD.PTX-LNCs represent a cutting-edge nanodelivery platform with exceptional promise, efficiently co-delivering dual therapeutics while unleashing potent additive/synergistic effects in both *in vitro* and *in ovo* models. This versatile nanosystem paves the way for next-generation combination therapies, offering a powerful strategy to amplify anticancer efficacy and overcome conventional treatment limitations.

SCAN ME

