

Mentha genus plant extract-loaded liposomes for cosmetic and dermatopharmaceutical applications

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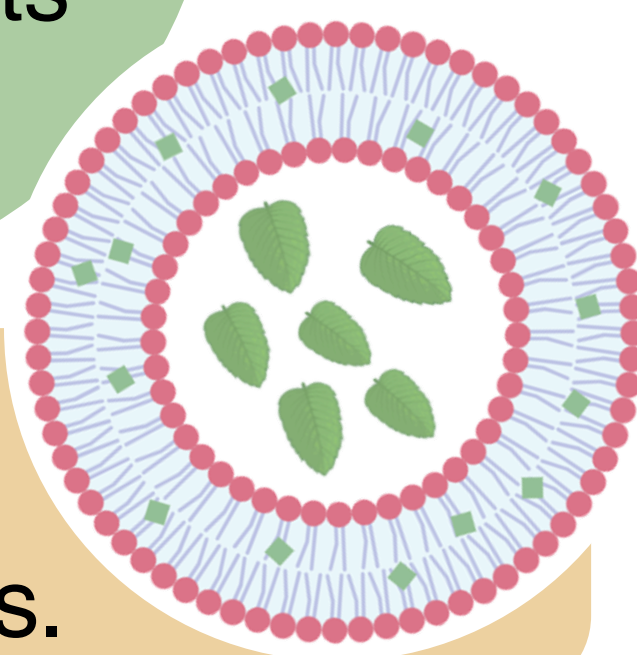
Introduction

Bioactive potential

Antioxidant
Anti-inflammatory
Anti-infective
Anticancer
[1, 2, 3, 4]

Cosmetic appeal

Distinctive fragrance
Refreshing sensation
Calming effects
[2, 3]



Challenge

Avoid the skin **degradation** of bioactive compounds.

Solution

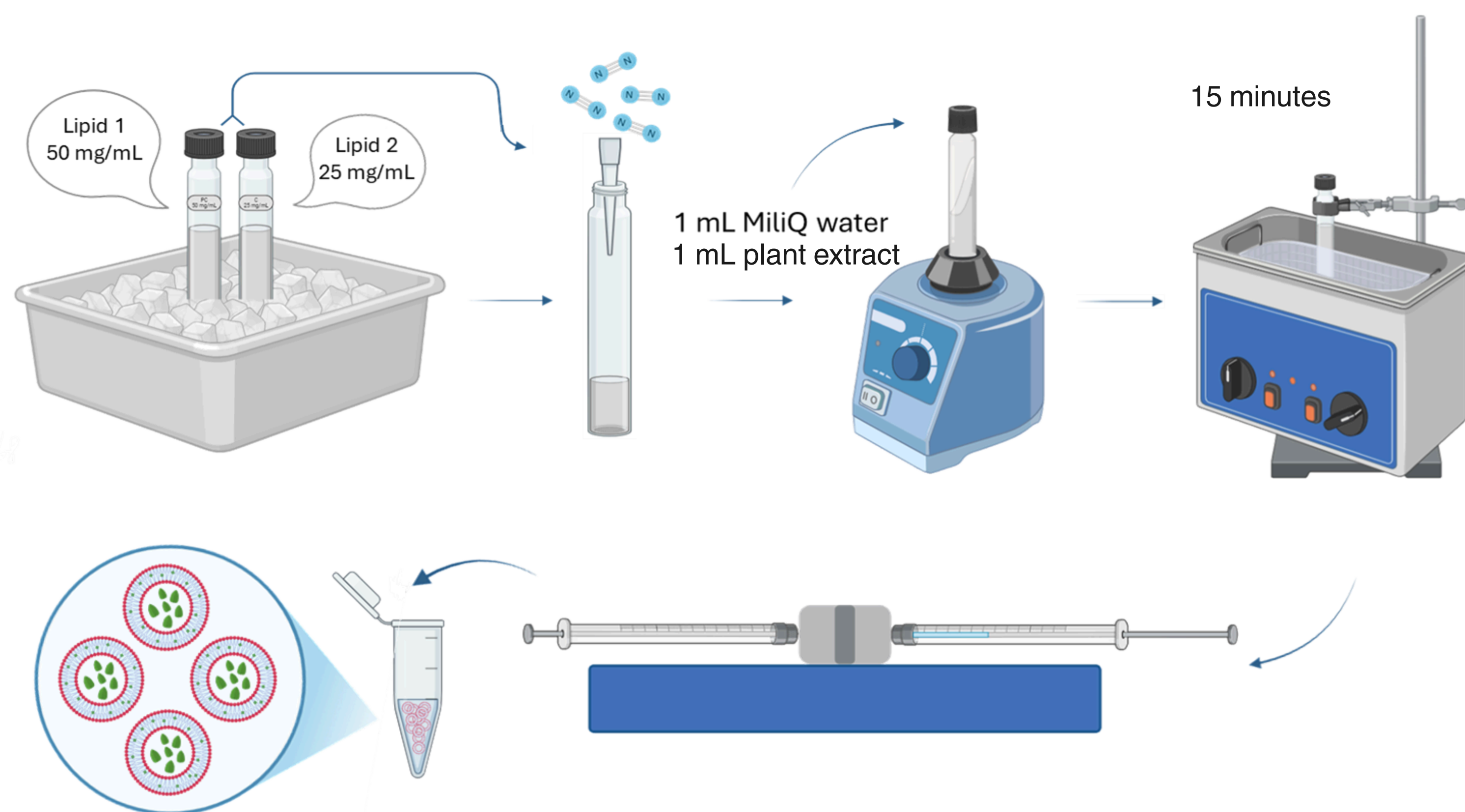
Liposomes: nanocarriers to protect and deliver compounds.

- Enhanced stability and controlled release.

Objective

Develop and optimize liposomal formulations;
Enhance **topical delivery** of the extract.

Methods



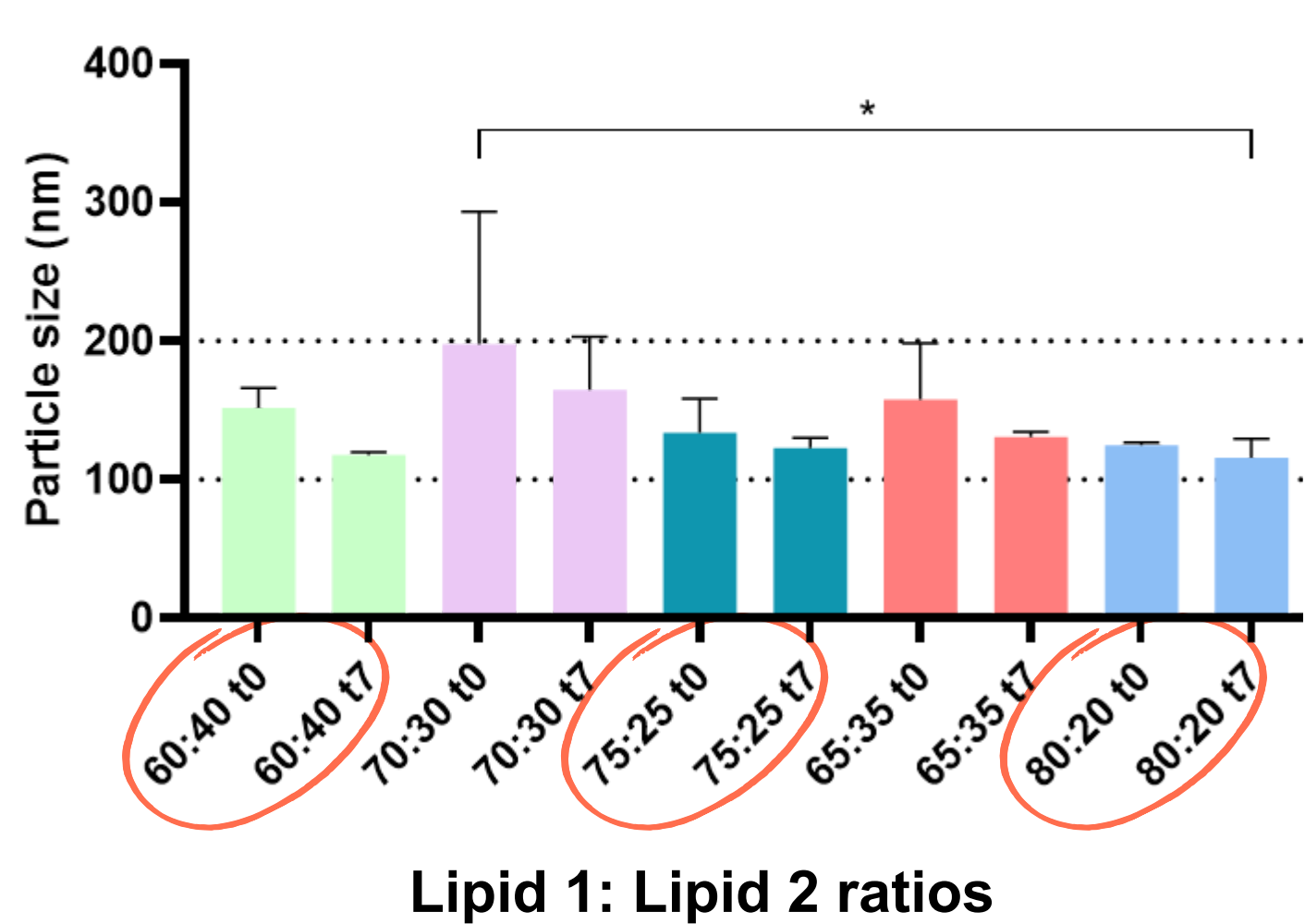
Lipid 1: Lipid 2 ratios
60:40, 75:25, 80:20

Extract concentrations
1, 2, 5, 10 mg/mL

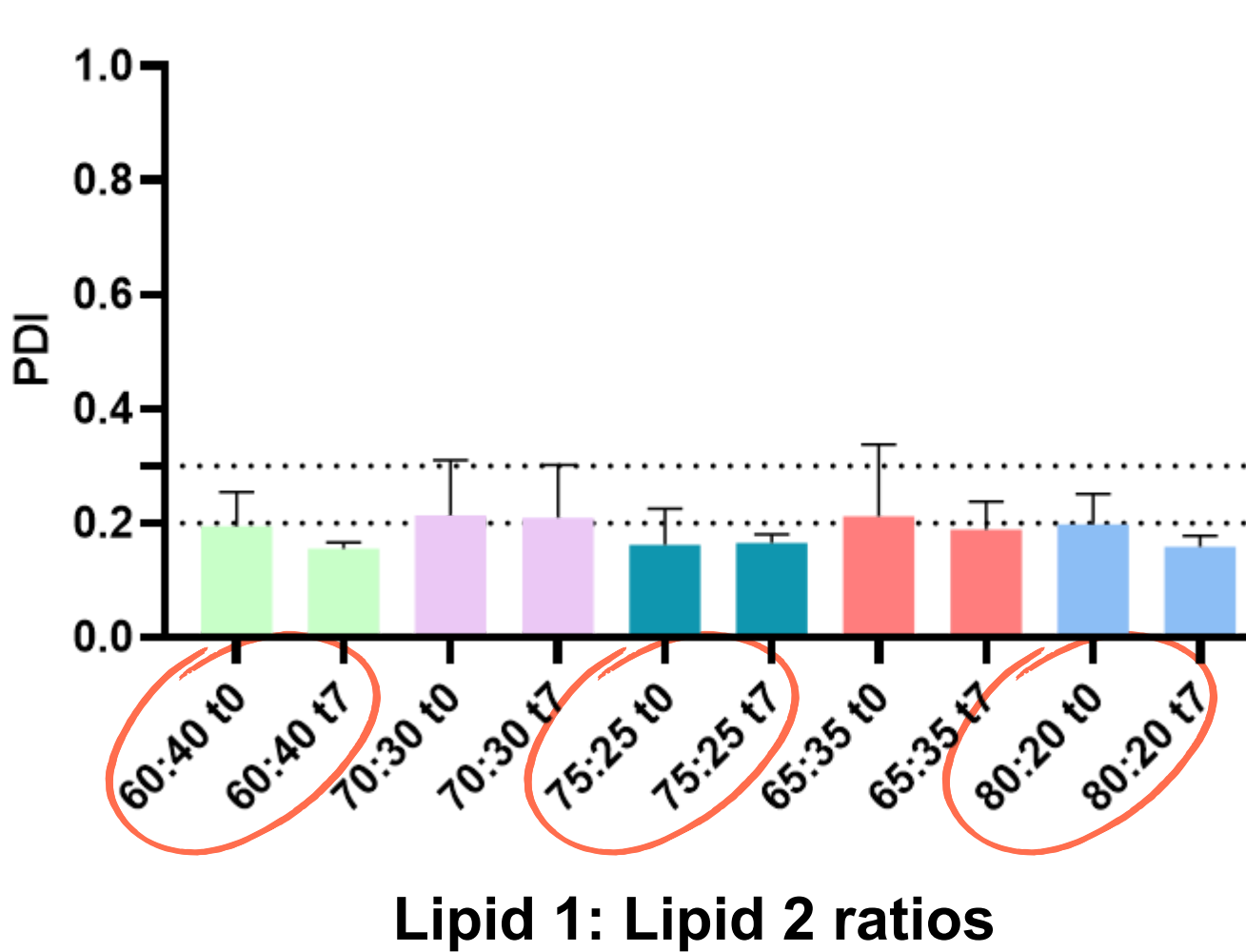
Results

Unloaded liposomes

Particle size

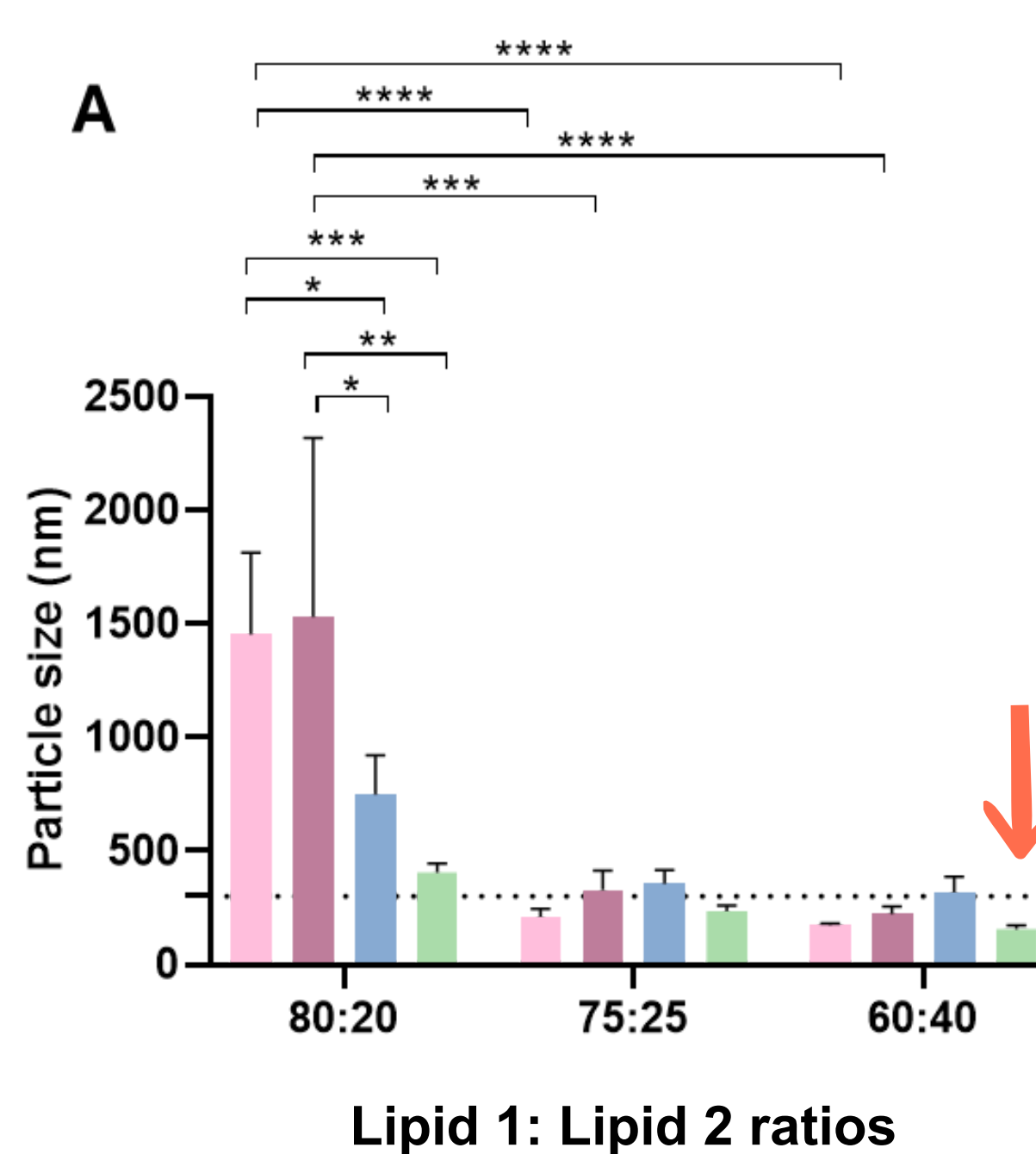


PDI

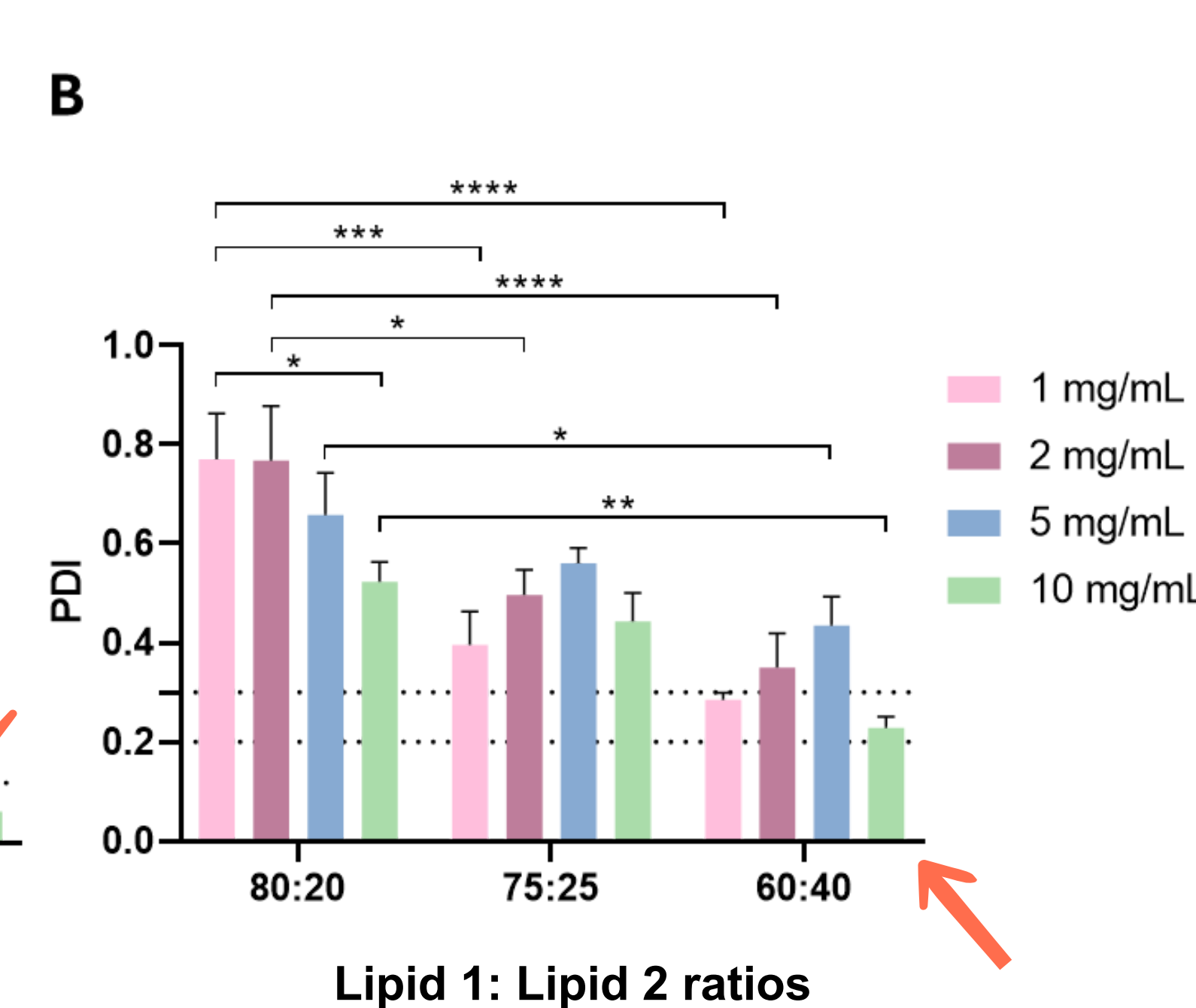


Extract-loaded liposomes

Particle size

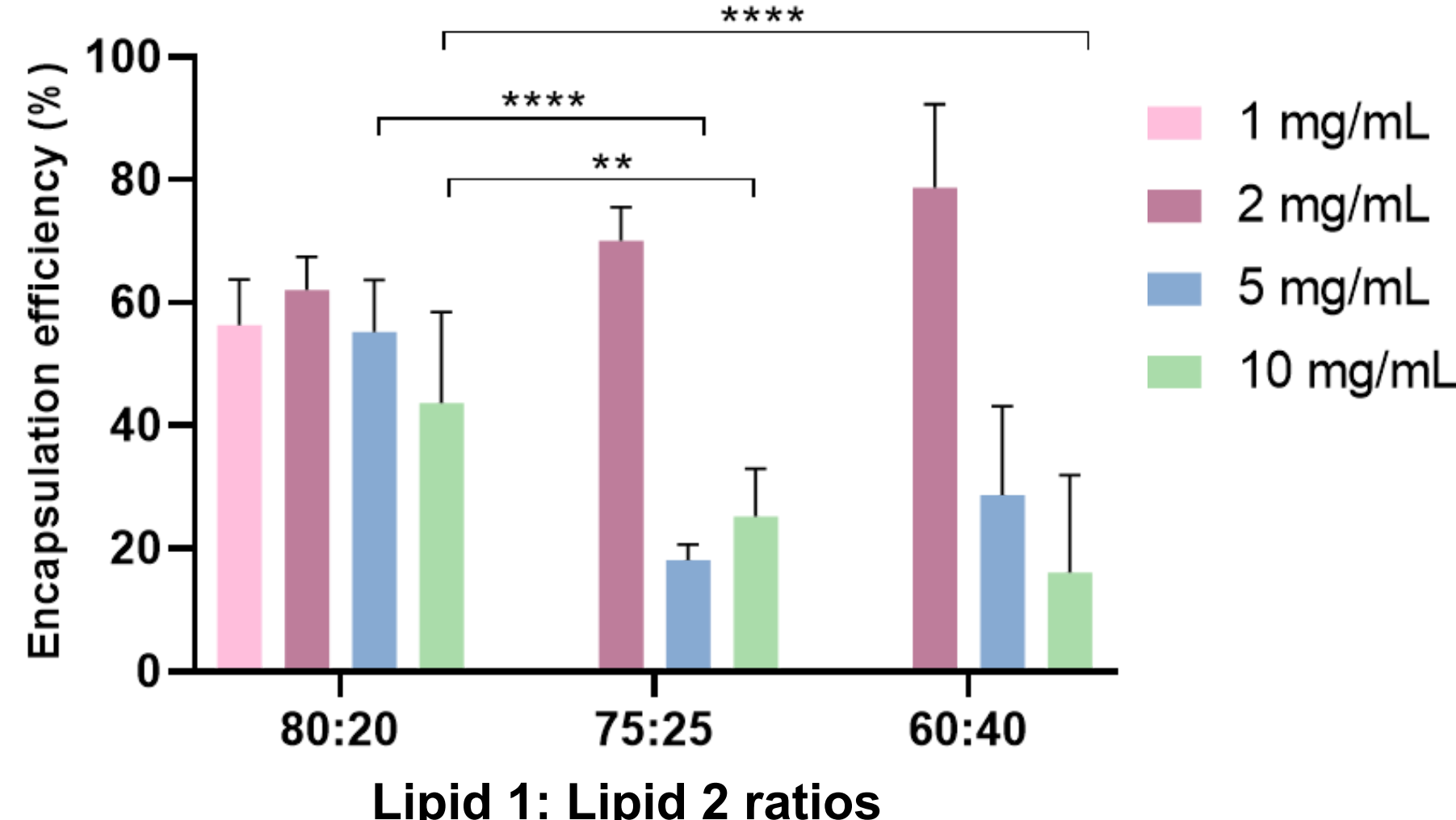


PDI



* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$

Extract encapsulation efficiency



- Size:** < 200 nm $\rightarrow$ optimized for topical delivery.
- PDI:** < 0.200 $\rightarrow$ ensured high homogeneity and stability.
- High EE% (~70%)** $\rightarrow$ confirmed the effectiveness of the thin-film hydration method for this specific extract.

Conclusion

- Liposomal nanocarriers:** promising platform for high-performance **dermatopharmaceutical and cosmetic applications**;
- Successful encapsulation:** **1.3 - 3.7 mg/mL** of plant extract, with **ideal characteristics** (Size < 200 nm, PDI < 0.200) for effective skin permeation and stability;
- Future studies** will assess stability, release profiles and antioxidant activity.

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