

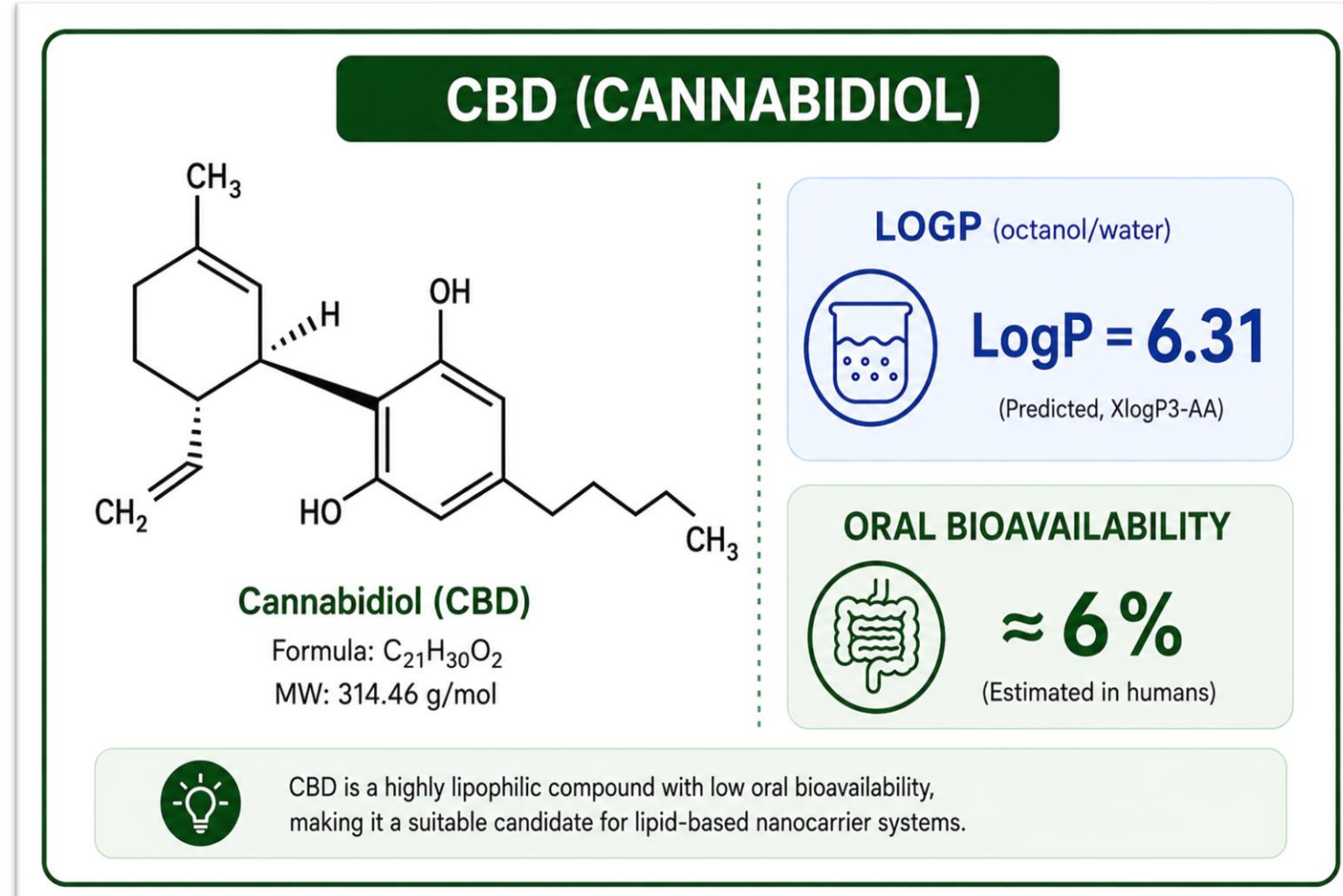
OPTIMIZED NANOSTRUCTURED LIPID CARRIERS IMPROVE THE ORAL DELIVERY OF CANNABIDIOL

Ananda Pulini Matarazzo¹, Gabriela Gerônimo², Pedro Gonçalves³, Eneida de Paula², Márcia Cristina Breitzkreitz¹.

1) Faculty of Pharmaceutical Sciences, University of Campinas; 2) Biomembrane Laboratory, Biology Institute, University of Campinas; 3) Croda Brasil. *Corresponding author: a237288@dac.unicamp.br

Introduction

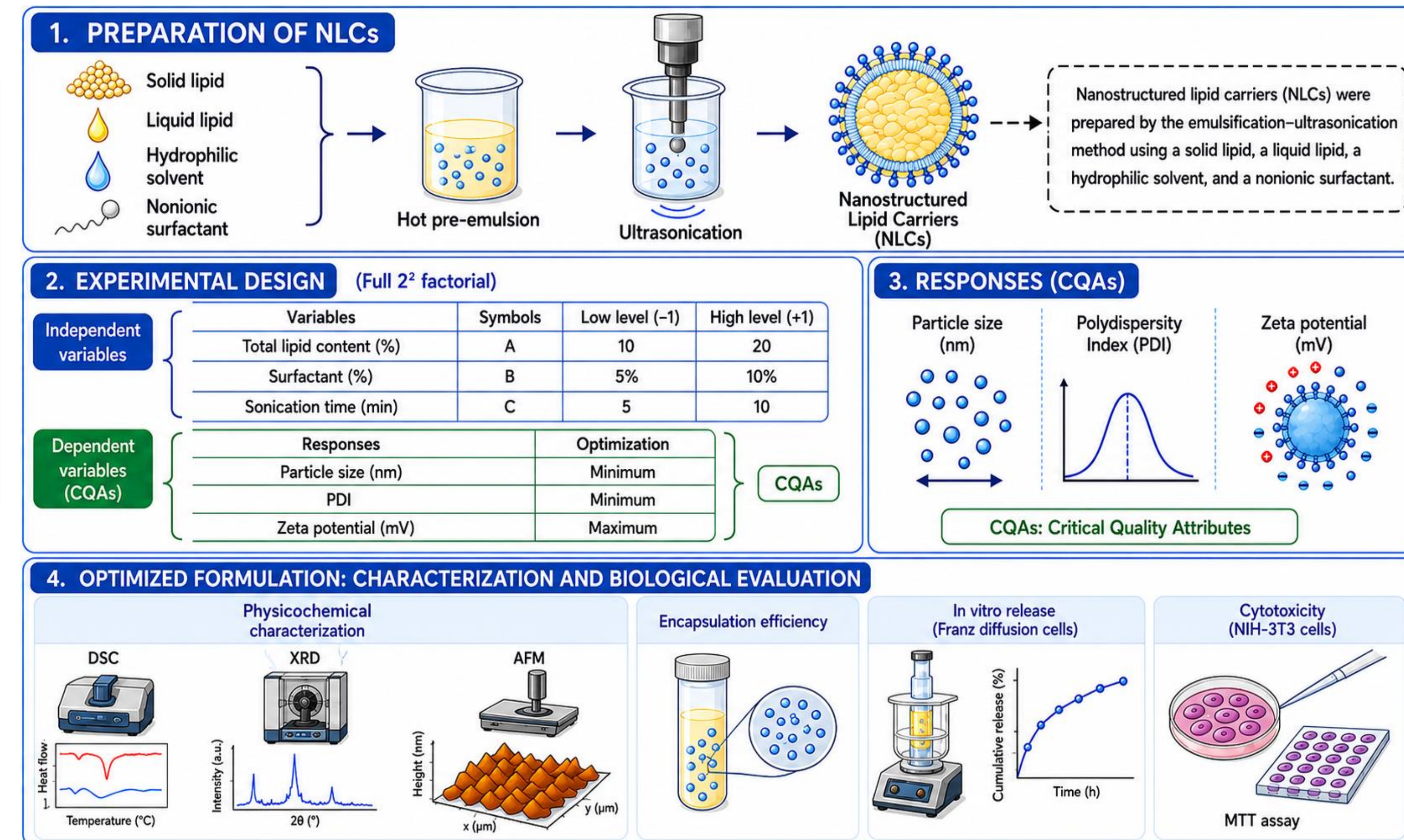
Oral administration of cannabidiol is limited by its high lipophilicity and low aqueous solubility, resulting in poor bioavailability and variable therapeutic efficacy.



Nanotechnology-based strategies have emerged as effective approaches to overcome these limitations.

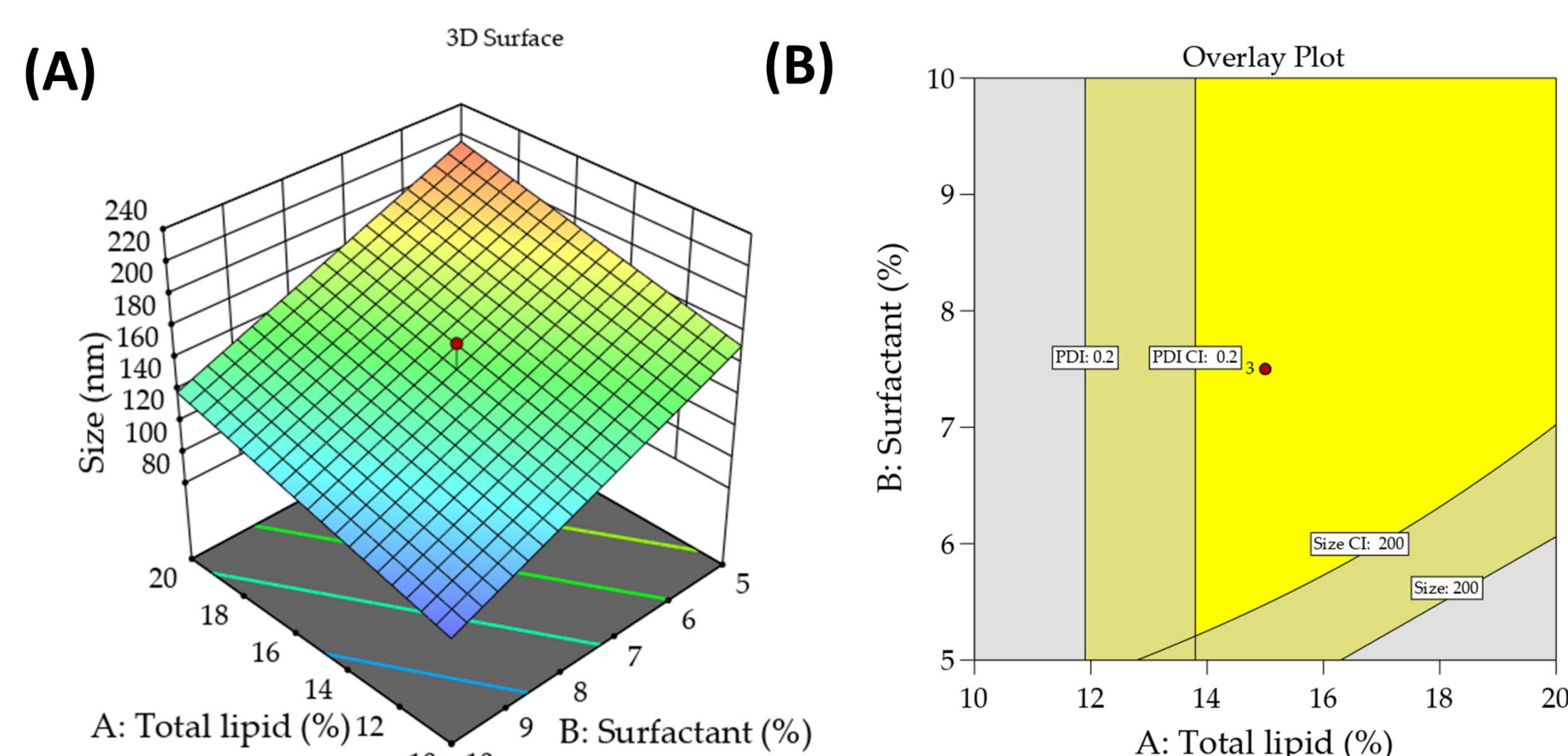
Objective

This study aimed to develop and optimize nanostructured lipid carriers (NLCs) as an advanced lipid-based delivery system to enhance the oral administration of cannabidiol (CBD).

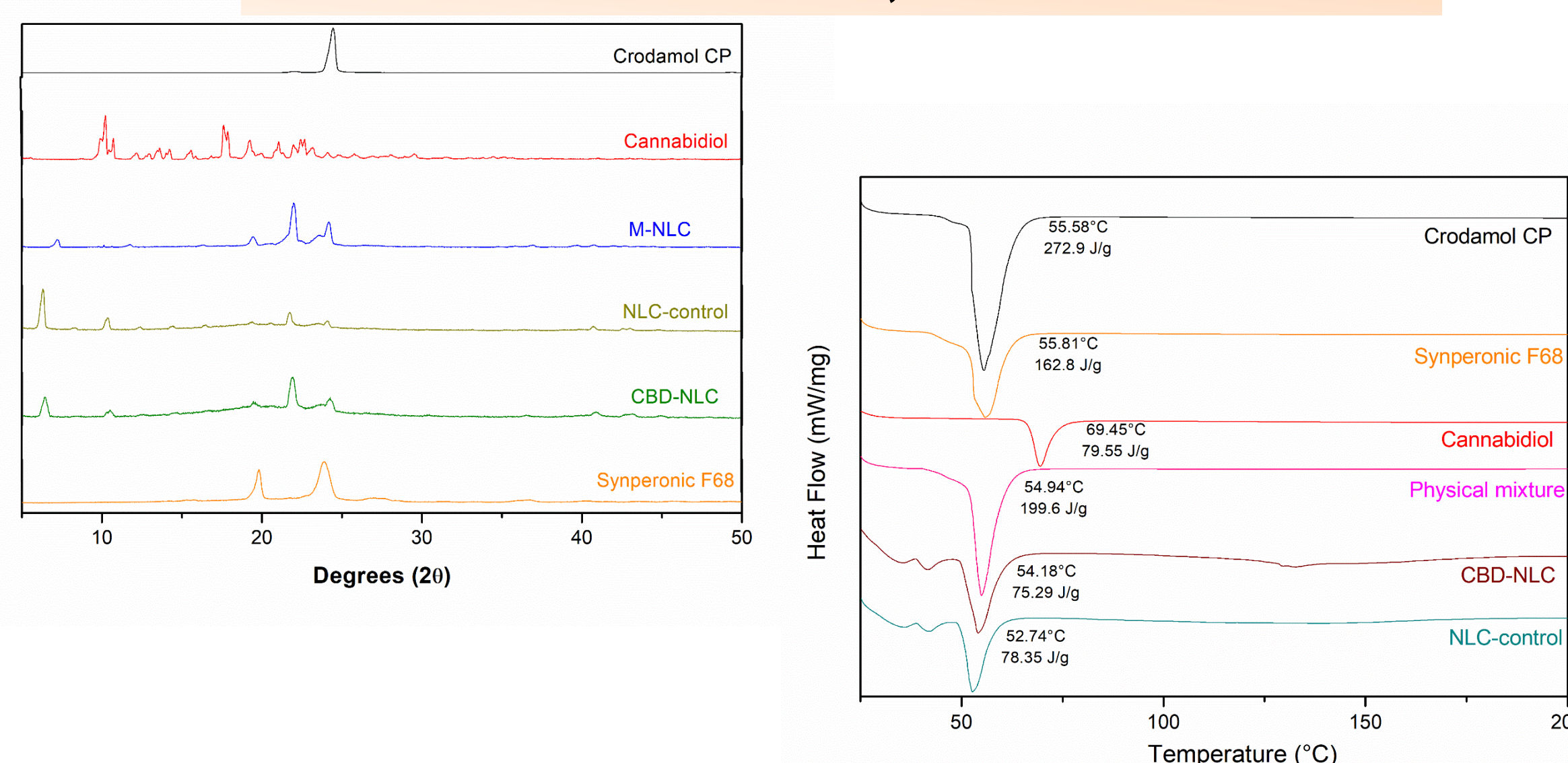


Results

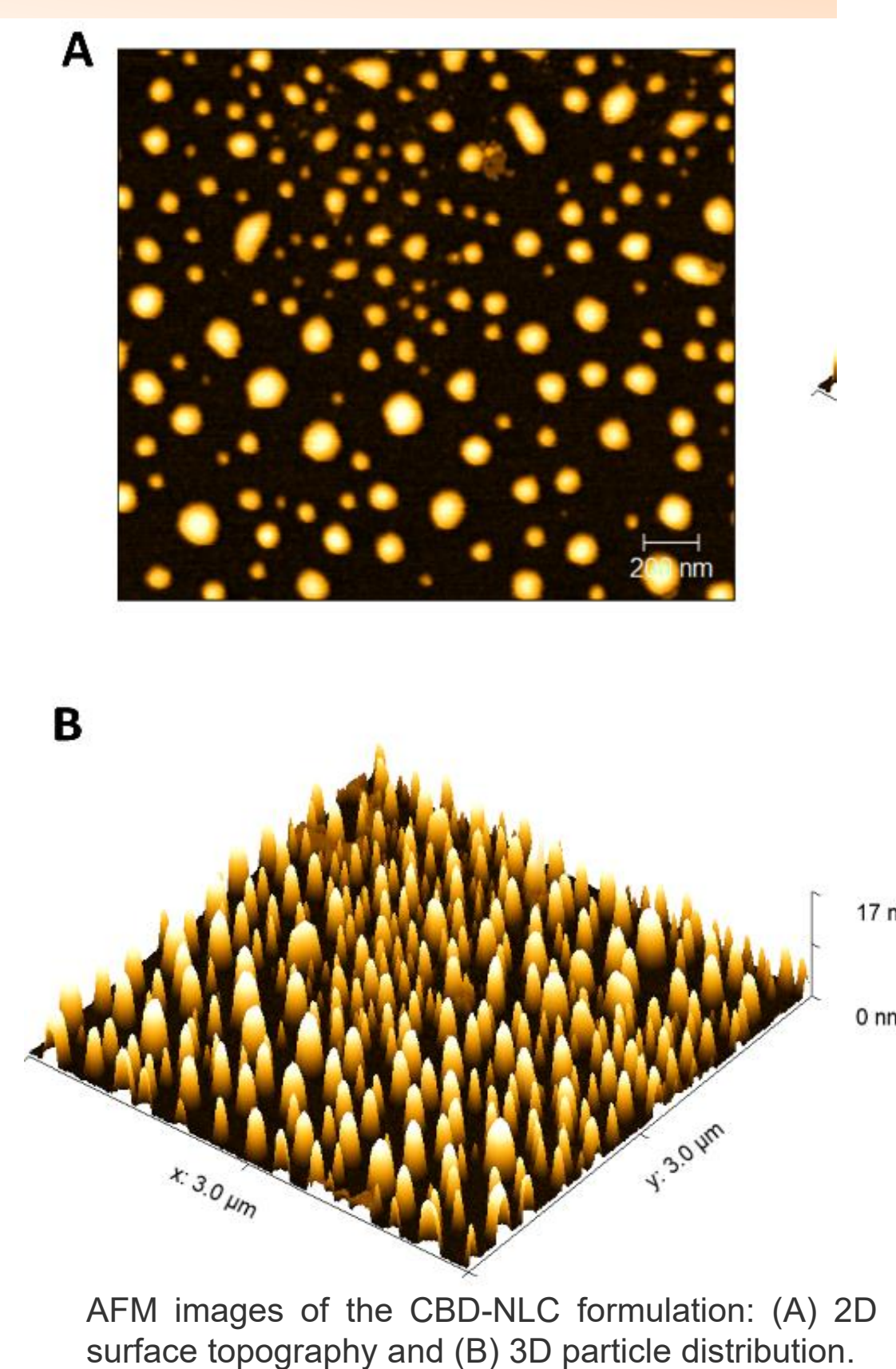
Optimization



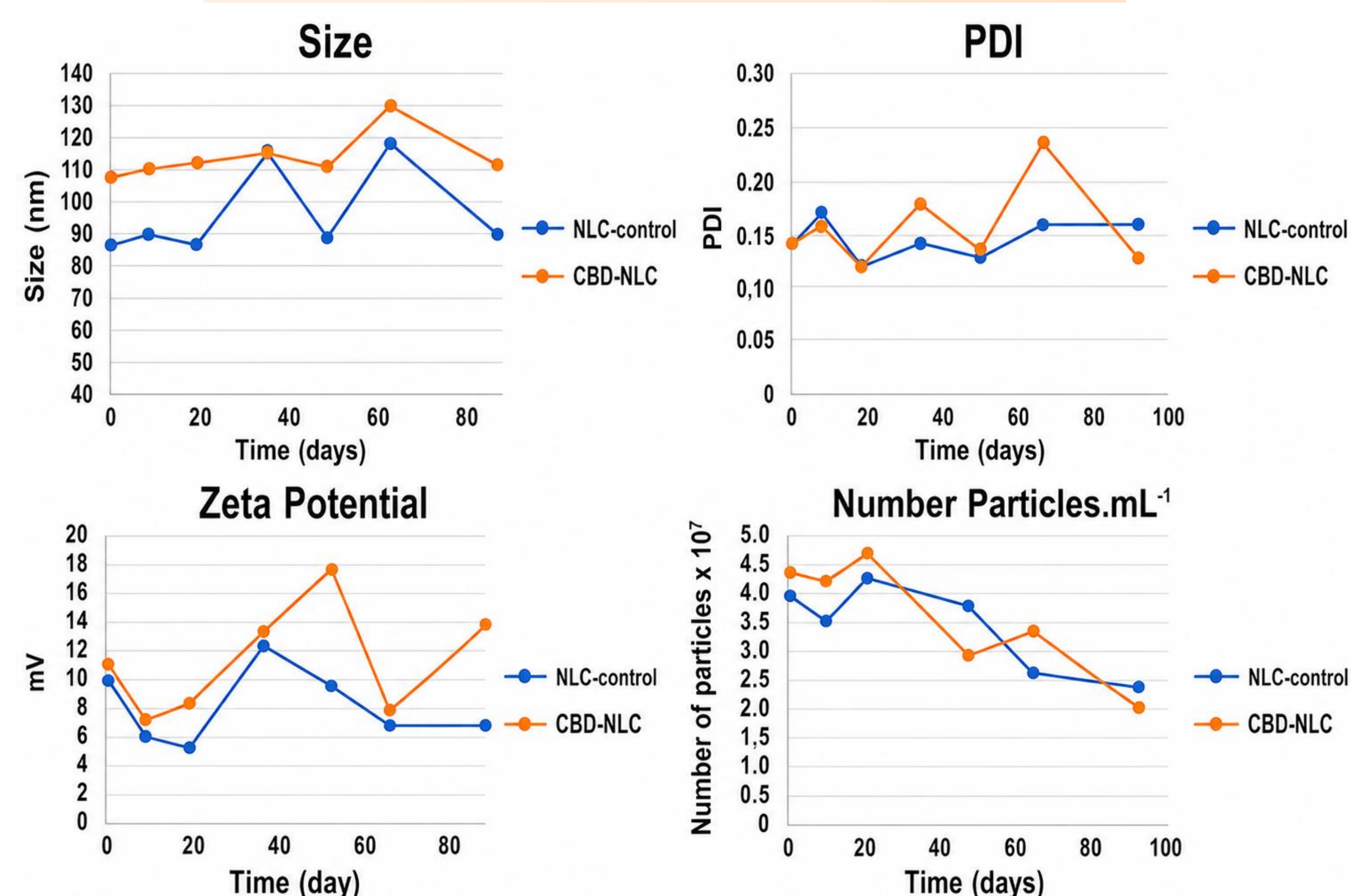
DSC and, XRD



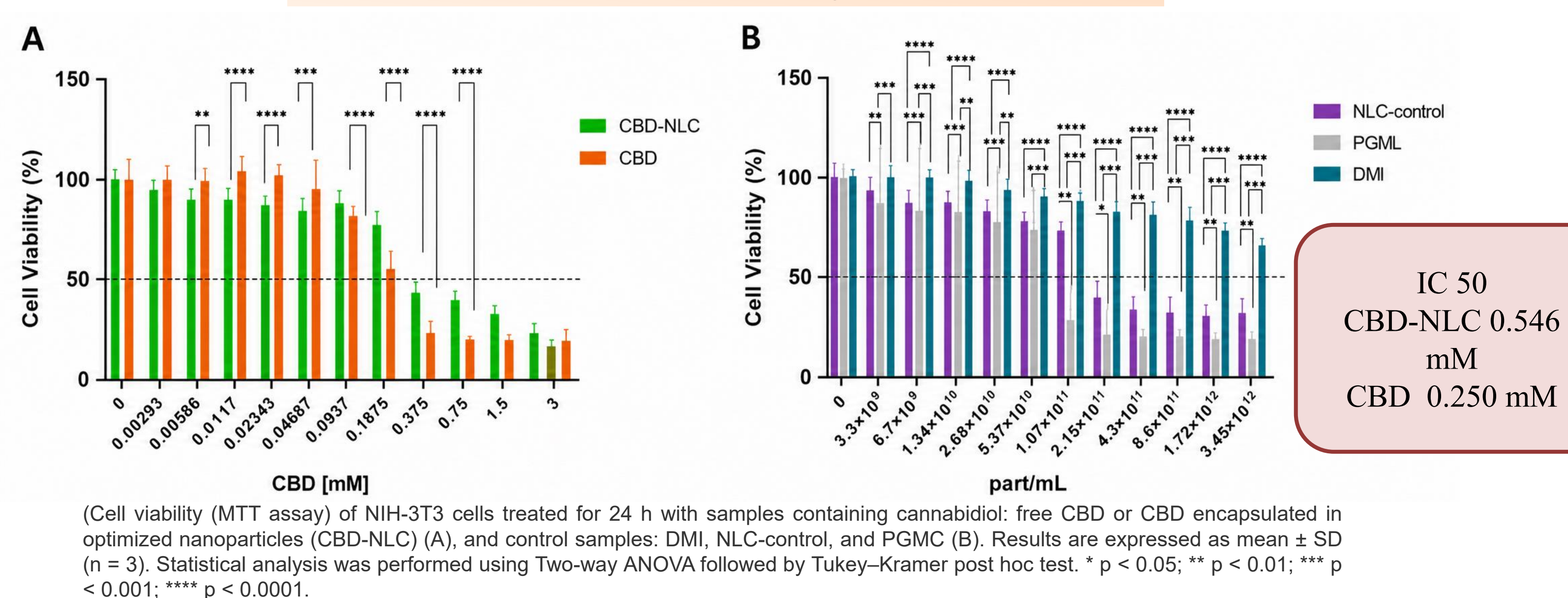
AFM



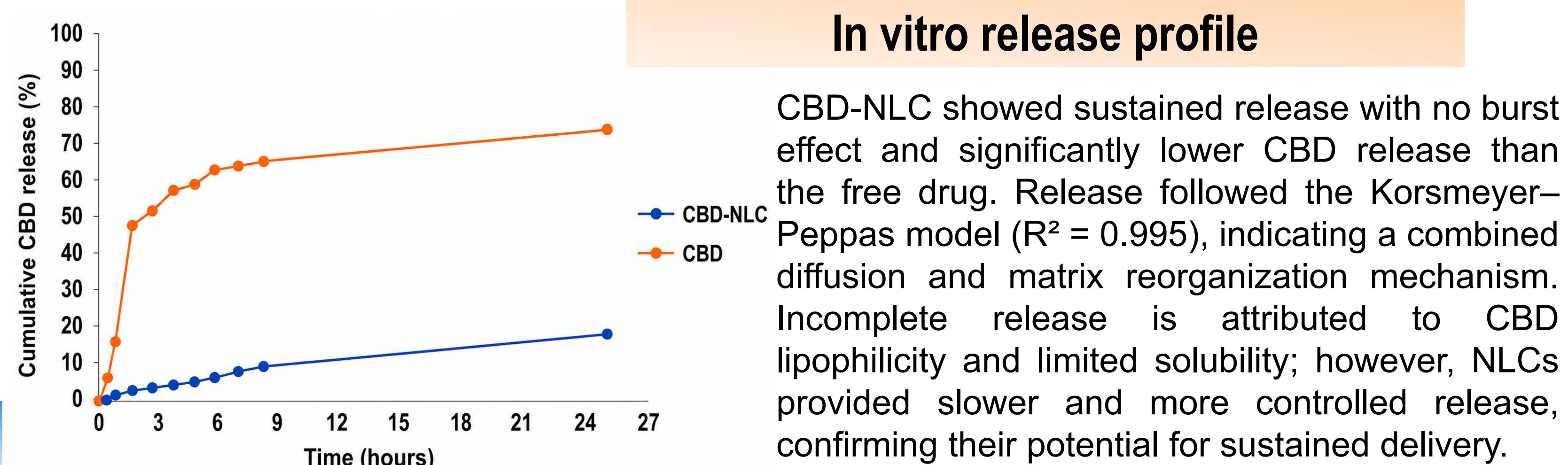
Stability Studies



Cell Viability



In vitro release profile



Conclusion

Optimized CBD-loaded NLCs showed particle sizes around 113 nm, low PDI, high encapsulation efficiency (97.3%), and physical stability for at least three months. CBD encapsulation significantly reduced cytotoxicity compared with free CBD and provided sustained drug release, supporting the potential of NLCs as an oral delivery platform for cannabidiol.

Acknowledgments