

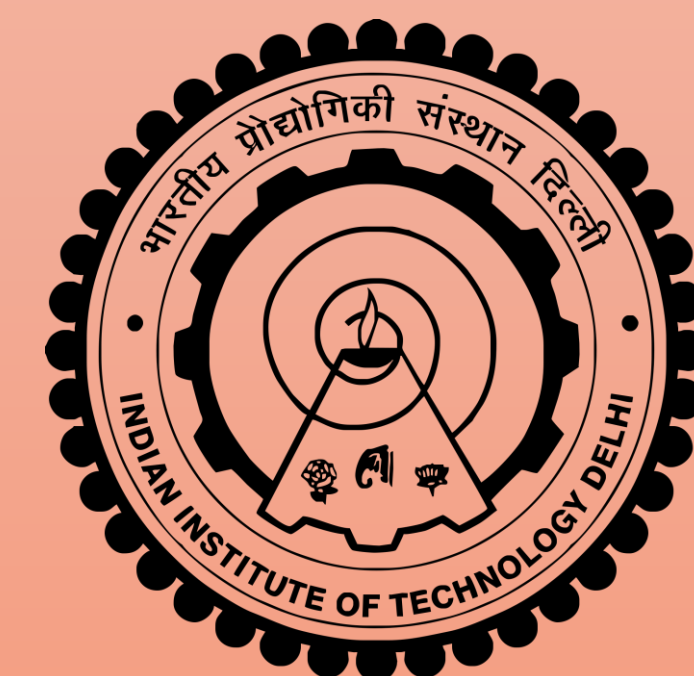
Peroxidase-Mimicking Nanozymes Coupled with Prodrug for Receptor-Mediated Targeting of Breast Cancer



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Aim

Engineering a nanozyme-based prodrug delivery system that transforms cancer's own microenvironment into a therapeutic trigger.

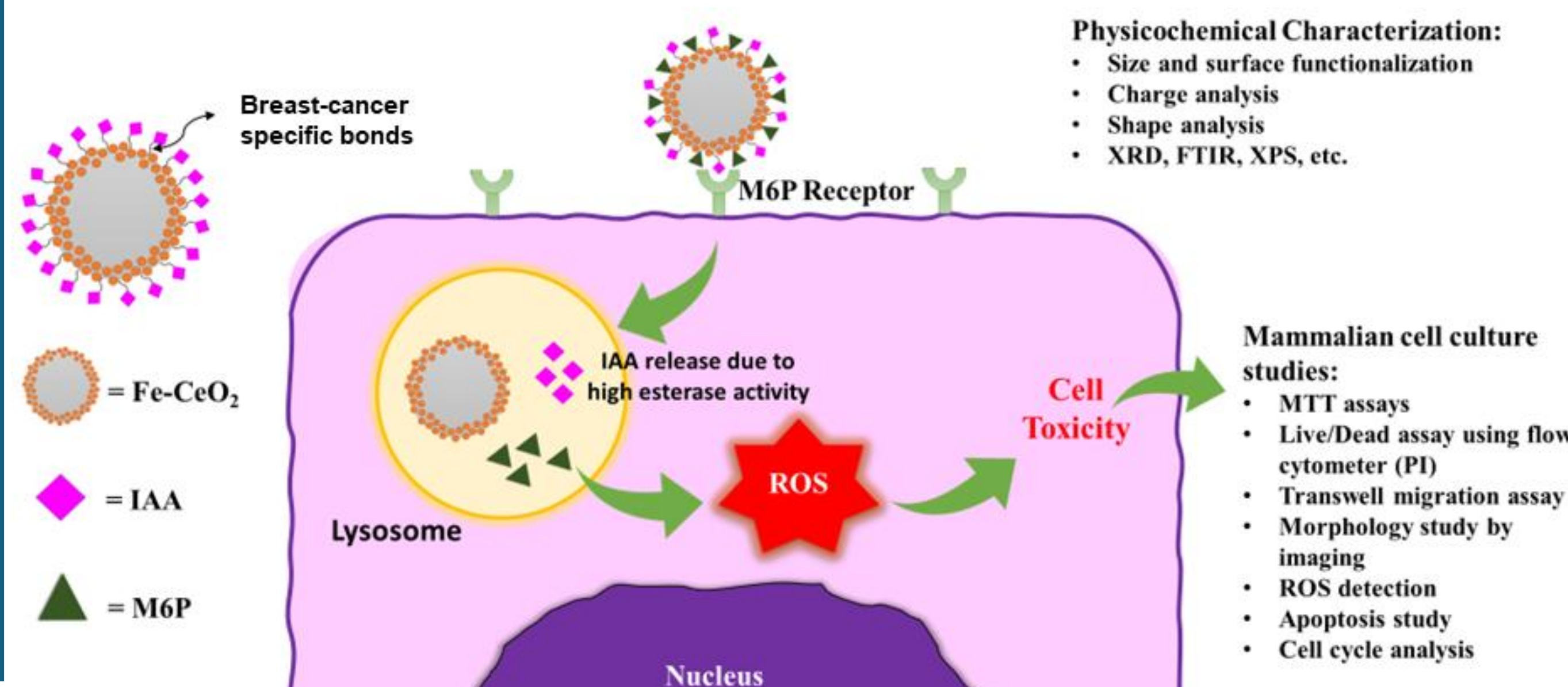
Introduction

Conventional breast cancer therapies often suffer from poor selectivity, systemic toxicity, and off-target effects, highlighting the need for smarter and more targeted therapeutic strategies.

Rationale

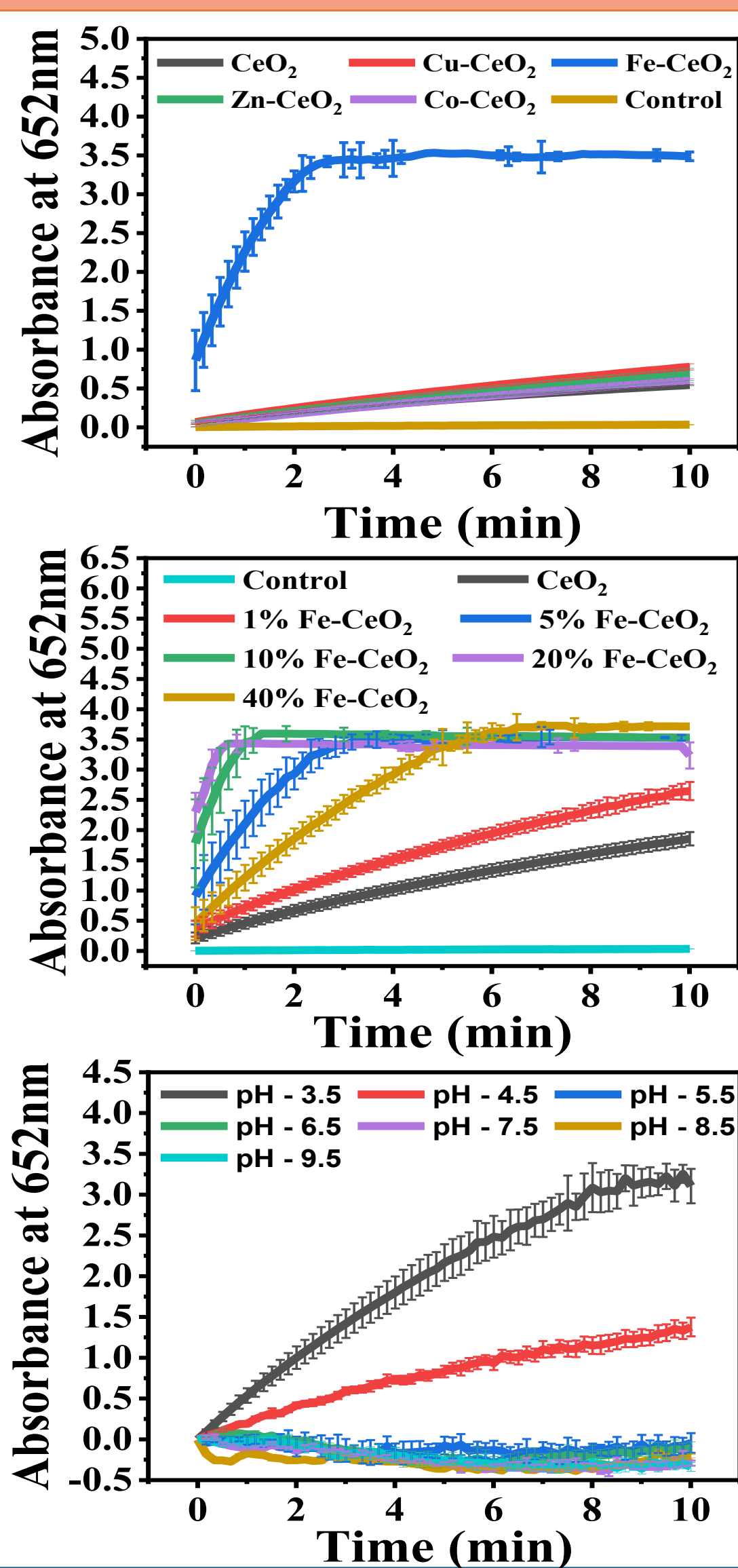
Can cancer-specific features, including overexpressed M6P receptors, elevated esterase activity, and acidic lysosomal pH, be exploited to achieve site-specific prodrug activation and selective cancer cell killing?

Graphical Abstract



Result and Discussion

Peroxidase Assay

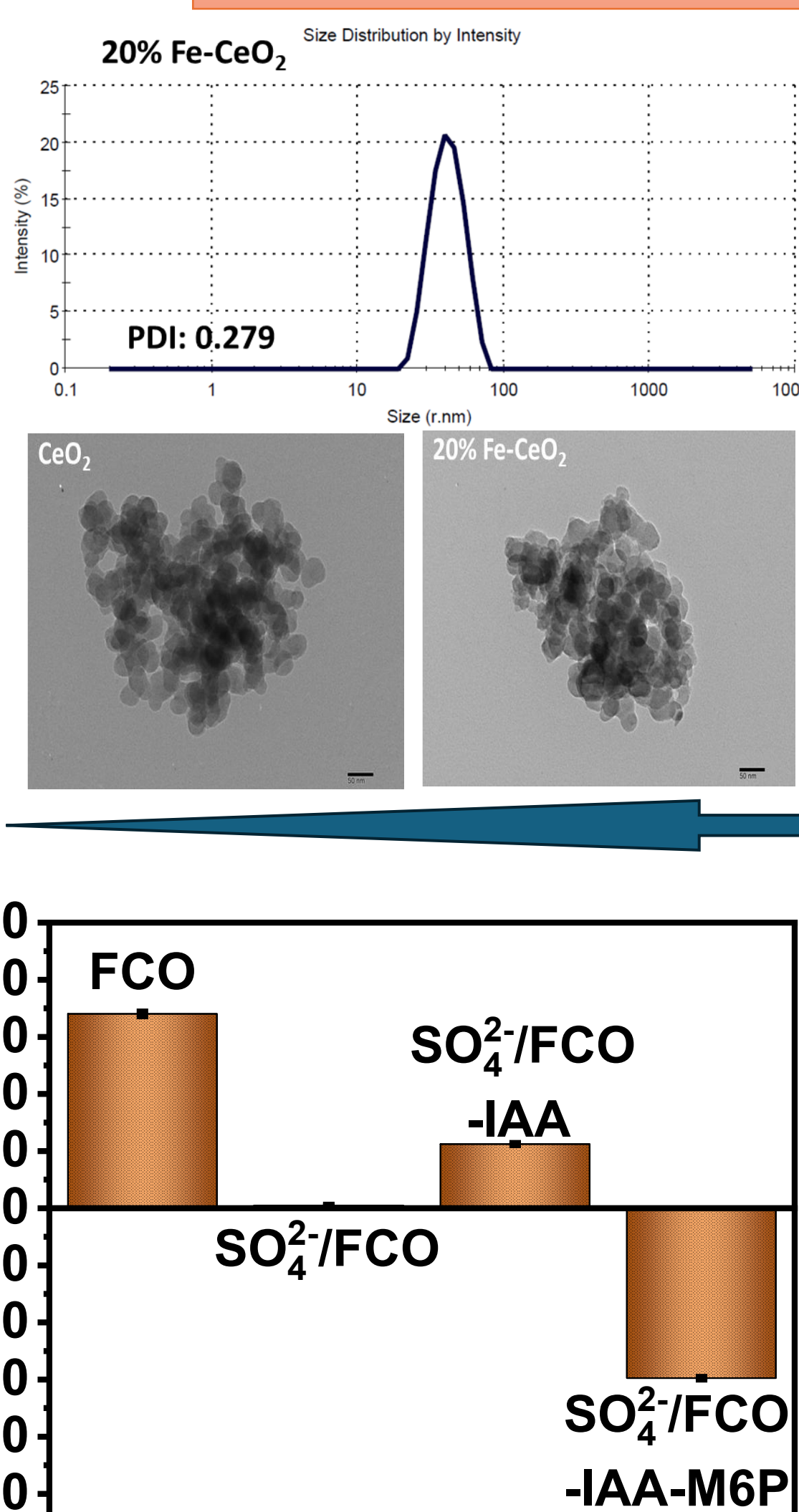


DLS

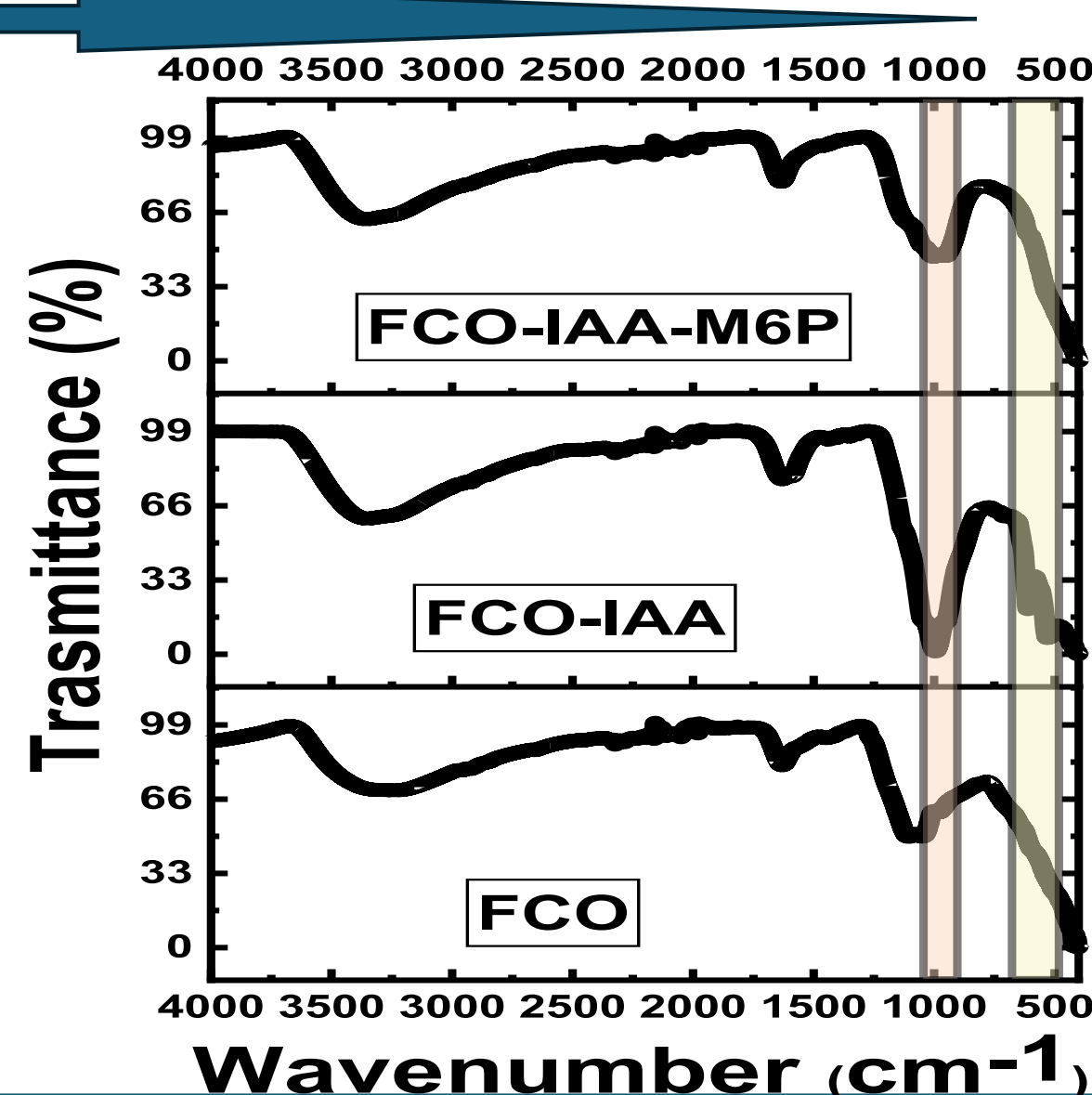
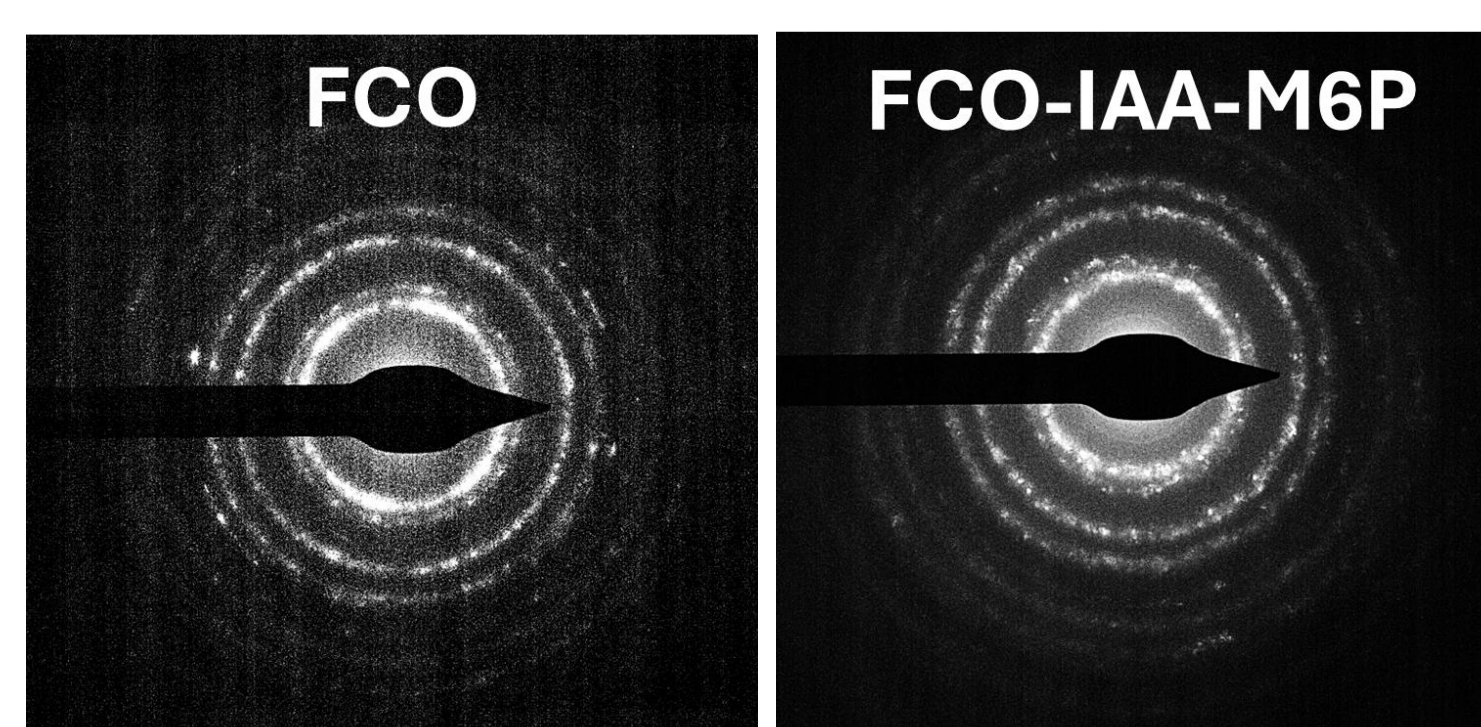
TEM

Zeta Potential

Characterization

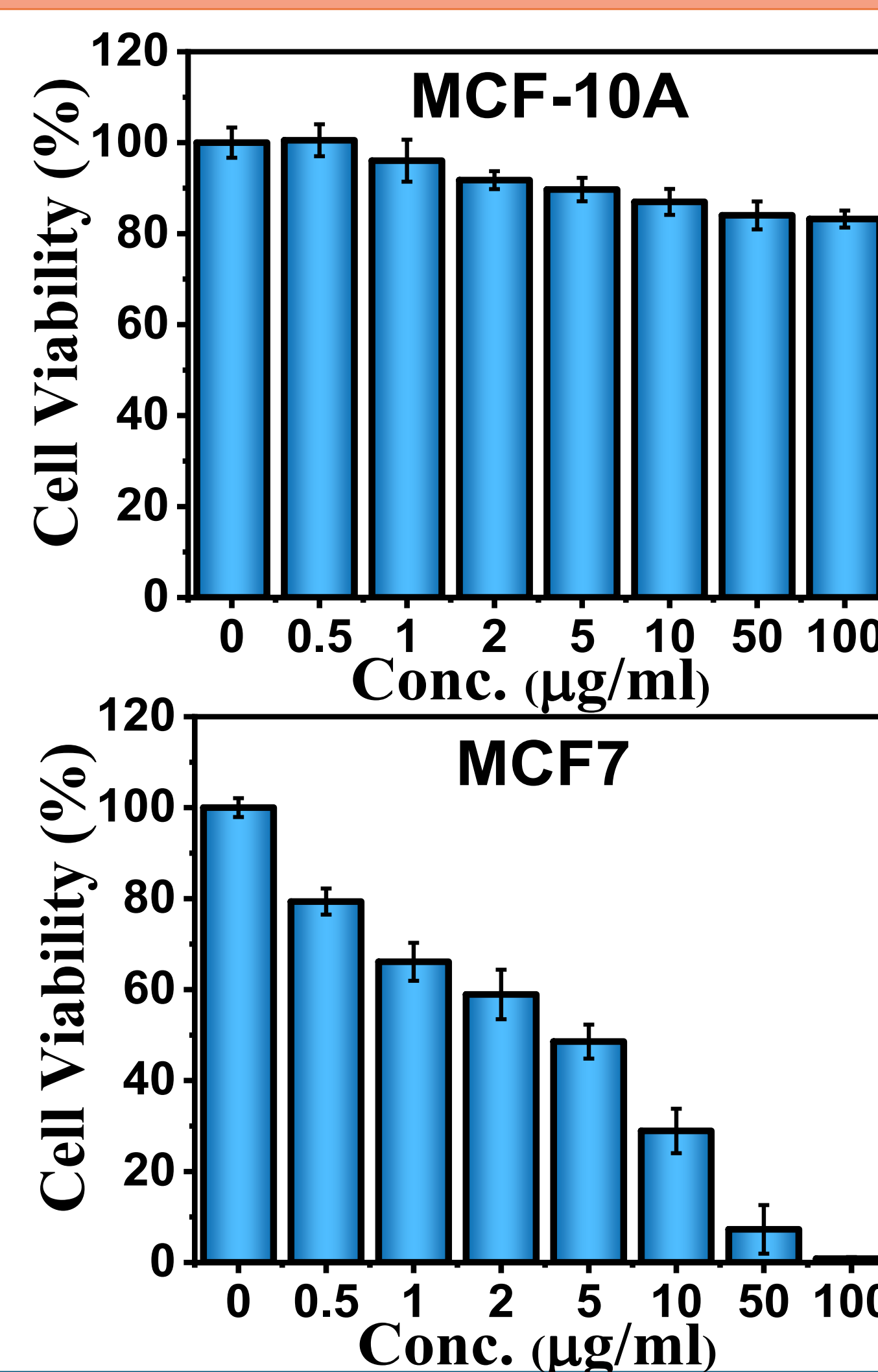


Selected Area Electron Diffraction

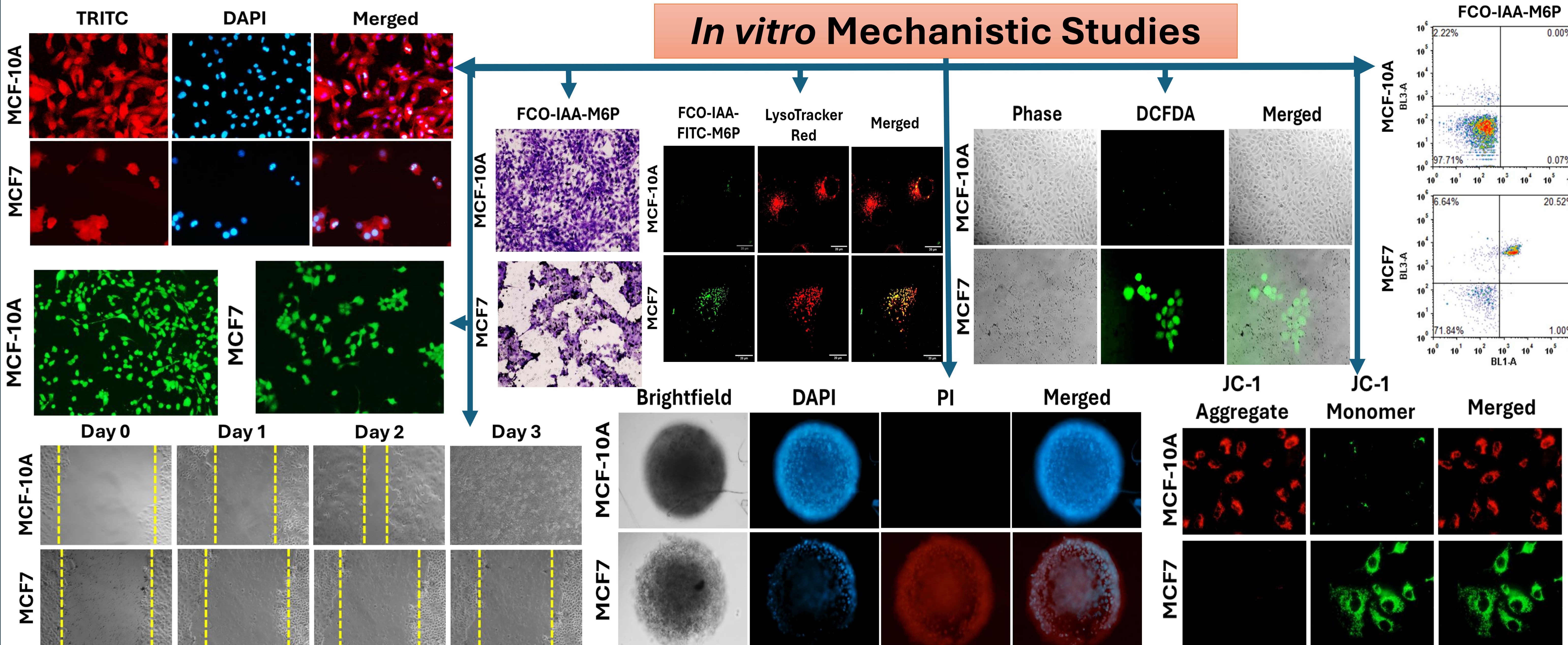


FTIR

Cytotoxicity Studies (MTT)



In vitro Mechanistic Studies



Conclusion

Targeted lysosomal uptake via M6P receptor-mediated endocytosis

Peroxidase nanozyme-driven IAA activation inside breast-cancer cells

Effective cancer cell killing with minimal off-target effects

References

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