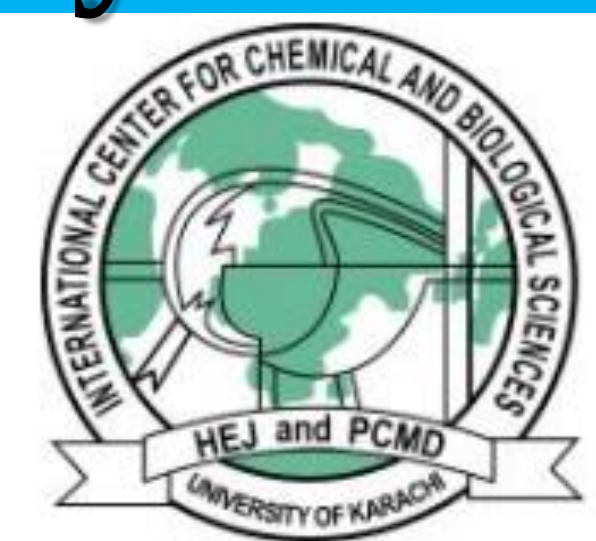


Synthesis and Characterization of Novel Amphiphilic Peptide and its Application in the Development of Niosomal Formulation as a Drug Delivery Carrier for Curcumin



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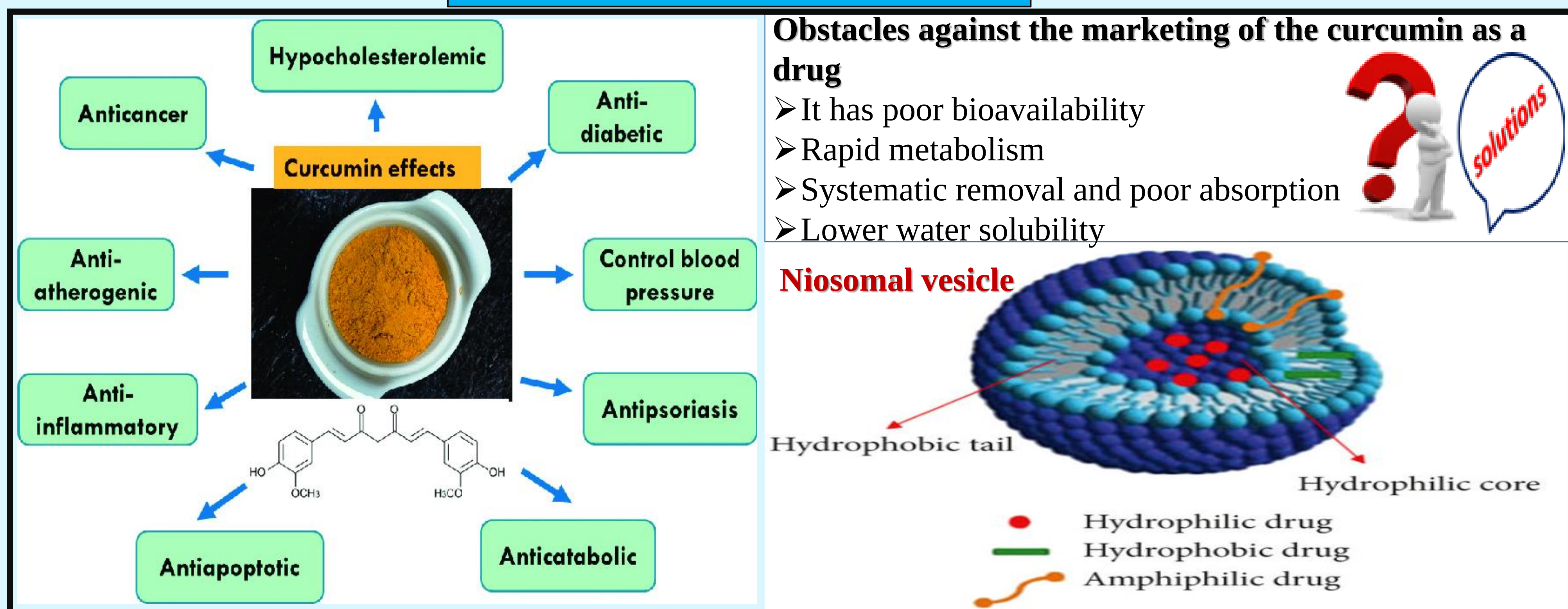
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ABSTRACT

The efficacy of curcumin (CR) against different types of cancers is significantly impeded by its non-specificity, low aqueous solubility, and high metabolism. In this study, novel amphiphilic peptide (AMP) was synthesized and their potential to carry CR into cancer cells via niosomal vesicles was examined. The synthesized AMP was characterized using several techniques such as FAB-MS, HRFAB-MS, ¹H- and ¹³C-NMR spectroscopy, which was then used to produce niosomal vesicles. CR loaded AMP niosomal vesicles (CR-AMP-Vesicles) were also characterized in terms of size, zeta potential, PDI, and surface morphology. CR-AMP-Vesicles exhibited smaller size of about 387.7 ± 1.76 nm with 77 ± 2.10% CR encapsulation and a regulated drug release profile. Furthermore, the cytotoxicity of produced vesicles on human normal fibroblast 3T3 cells was studied and found to be non-cytotoxic. When tested on a chronic myeloid leukemia cell line, CR-AMP-Vesicles and CR showed 51% and 54% inhibition, respectively with the IC₅₀ of 25 μM. Hence, it is concluded that the newly developed novel CR-AMP-Vesicles have the potential to substantially reduce the cytotoxicity of bioactive compounds against normal cells

INTRODUCTION AND OBJECTIVES



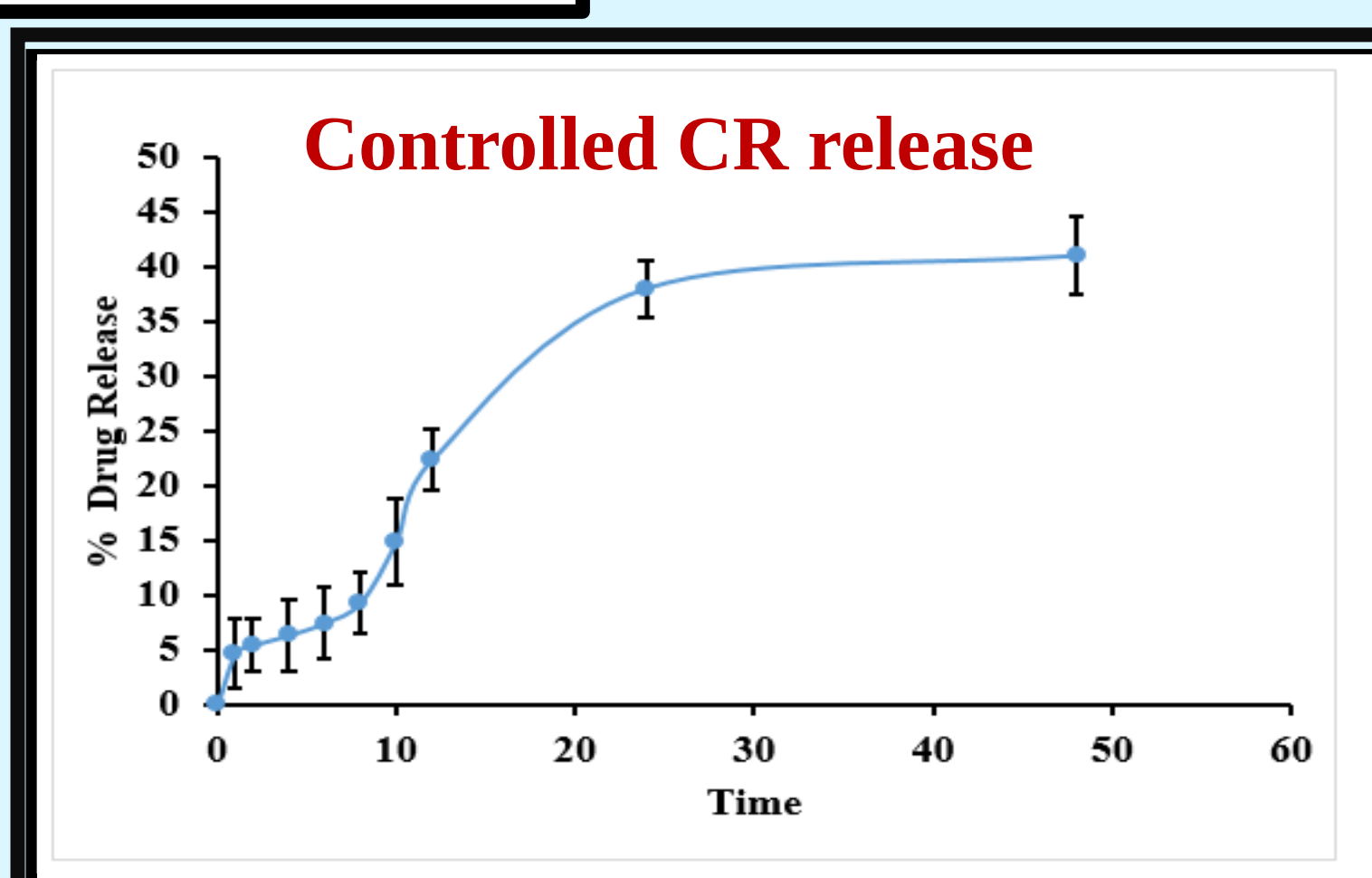
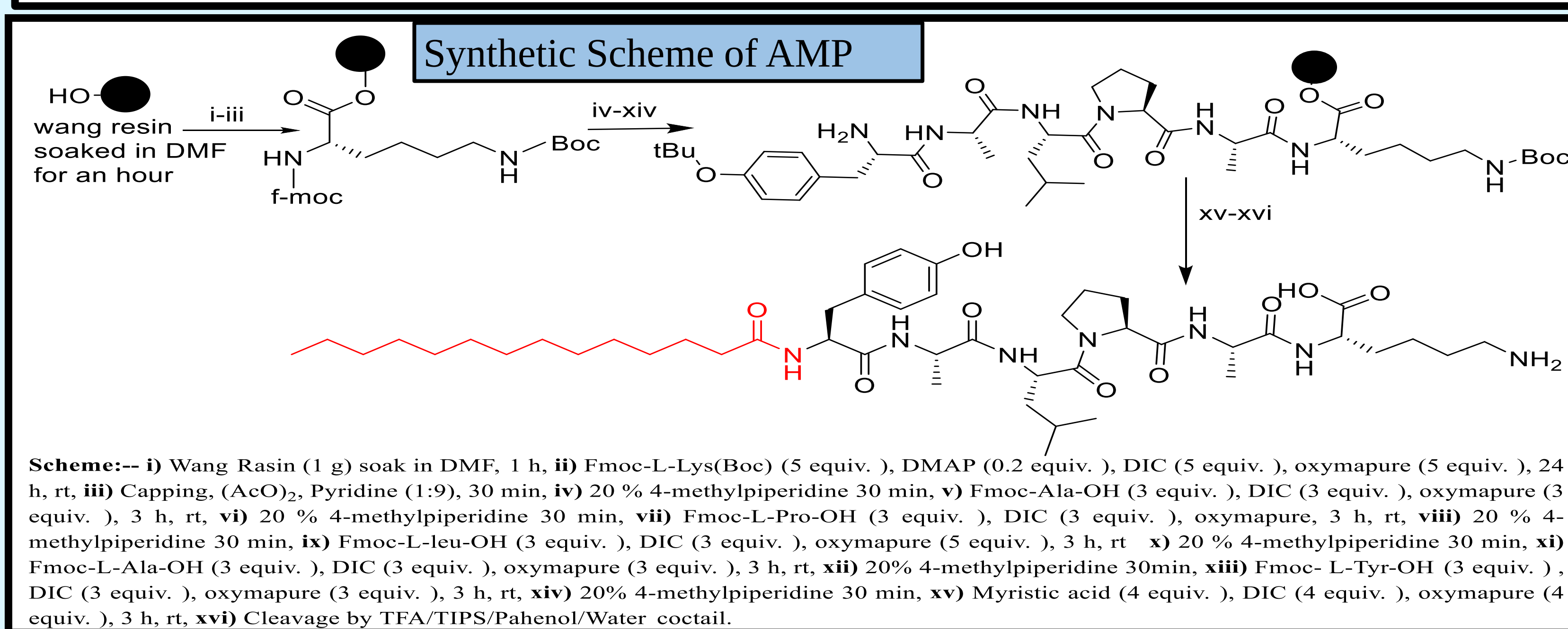
Obstacles against the marketing of the curcumin as a drug

- It has poor bioavailability
- Rapid metabolism
- Systematic removal and poor absorption
- Lower water solubility



METHODOLOGY

- Solid phase peptide synthesis strategy was used to synthesize the amphiphilic peptide (AMP).
- Curcumin loaded AMP niosomal vesicles (CR-AMP-Vesicles) were developed using thin film hydration method.

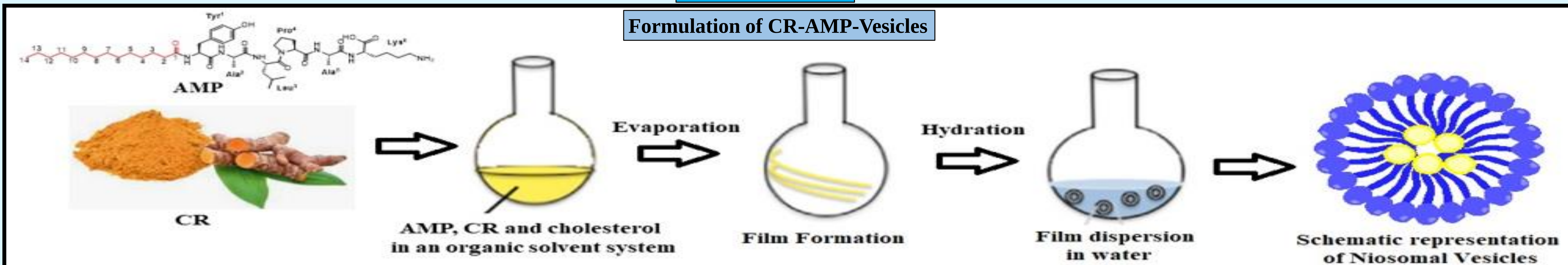


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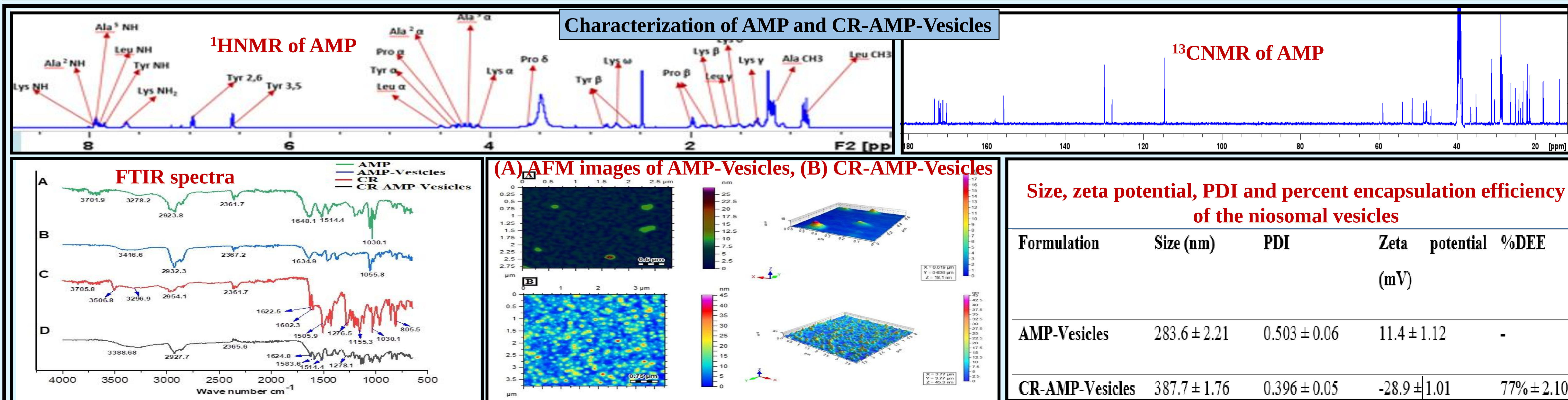
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EXPERIMENTAL

Formulation of CR-AMP-Vesicles

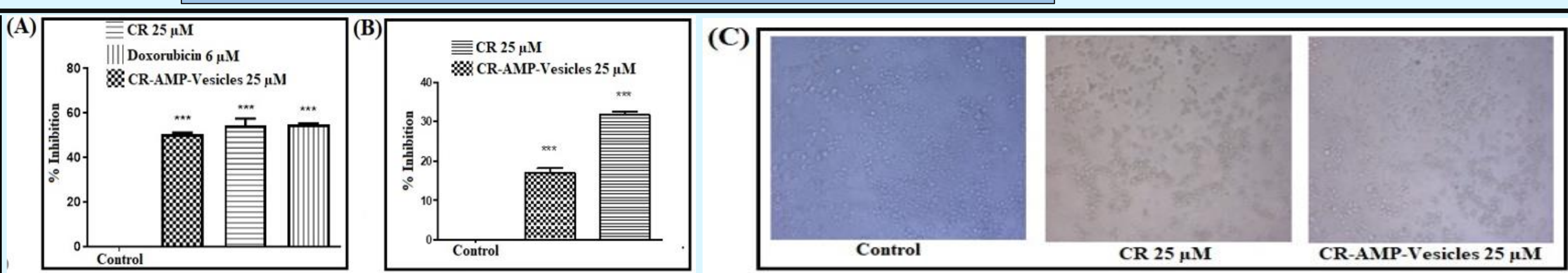


Characterization of AMP and CR-AMP-Vesicles



RESULTS

(A) In-vitro anticancer activity, (B) Cytotoxicity, (C) Images of leukemia cancer cells



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