IECC 2024 Conference
The 4th International Electronic Conference on Cancers
06–08 March 2024 | Online

# OPTIMIZATION AND DEVELOPMENT OF MAGNETICALLY TRIGGERED LETROZOLE NANOLIPOSOMES FOR BREAST CANCER TARGETING

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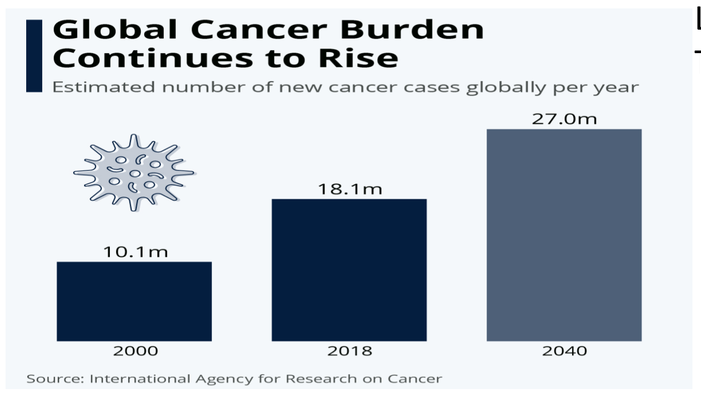
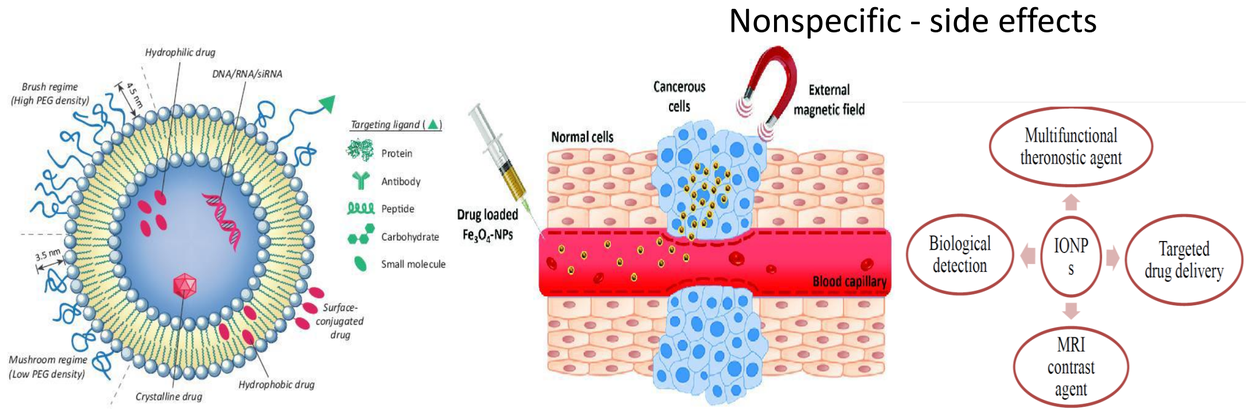
## INTRODUCTION & AIM




Late diagnosis and metastasis
Therapy failure
- Poor (ADME) pharmacokinetics
- Poor bioavailability
- Poor selectivity
- Drug resistance
- Drug loss due to first pass metabolism
- High drug dosing & drug tolerance
- Nonspecific - side effects




**AIM:**

The present work aims to develop, characterize and evaluate letrozole loaded magnetic nanoliposomes for its use in estrogen positive breast cancer therapy.

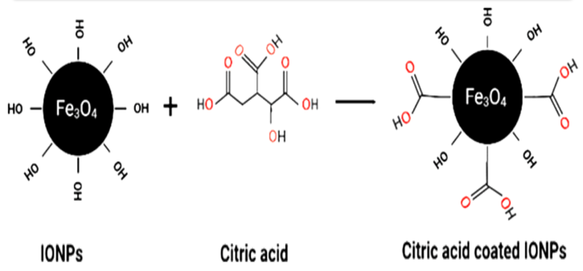
**OBJECTIVES:**

- Develop magnetic field – guided letrozole-loaded nanoliposomes.
- Optimize letrozole-loaded magnetic nanoliposomes preparation conditions.
- Characterize and evaluate the physical and pharmaceutical properties of the nanoliposomes.
- Invitro study to evaluate the toxicity activity of letrozole–loaded nanoliposome.

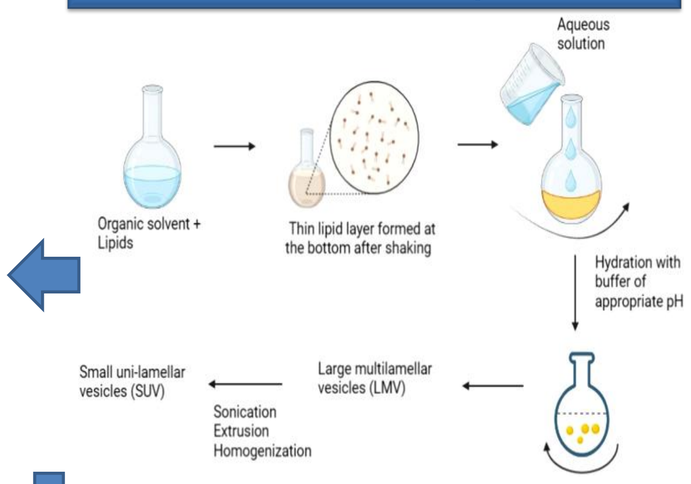
## METHOD

### Synthesis of Ferrofluid

### Stabilization with Critic Acid



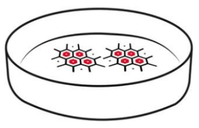

### Formulation of Nanoliposomes




### Characterization

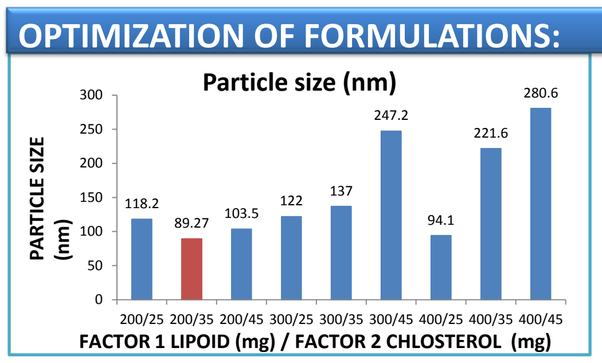
Optimization using Design Expert® DX 11.1.2.0 (Stat-Ease Inc., MN) license version software,
Particle size Distribution,
Fourier Transform Infrared Spectroscopy,
Drug Content,
Encapsulation Efficiency,
In-vitro Drug Release,
Zeta Potential, etc,.

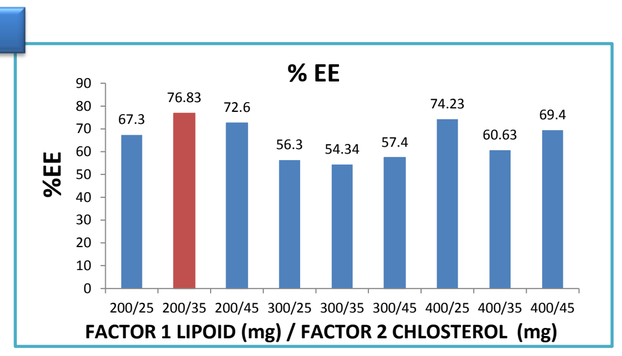
### MCF-7 BREAST CANCER CELL LINE STUDY



## RESULTS & DISCUSSION

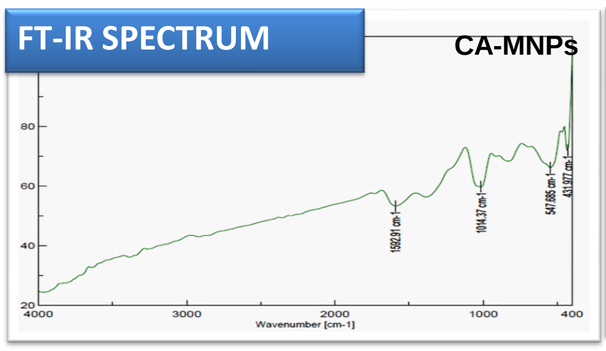
### OPTIMIZATION OF FORMULATIONS:

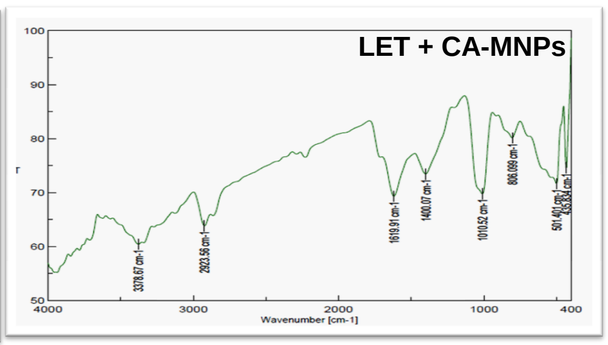


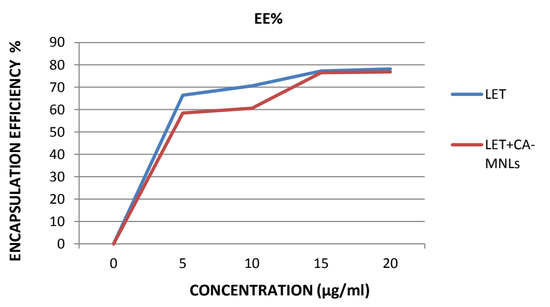

| Materials | Hydrodynamic size (nm) | Zeta potential (mV) | Polydispersity Index |
|---|---|---|---|
| CA-MNPs | 72.6 | -17mV | 0.426 |
| CA-MNLs-LET | 89.23 | -24mV | 0.395 |

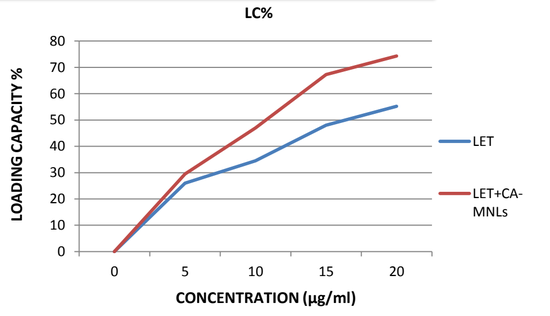
### FT-IR SPECTRUM



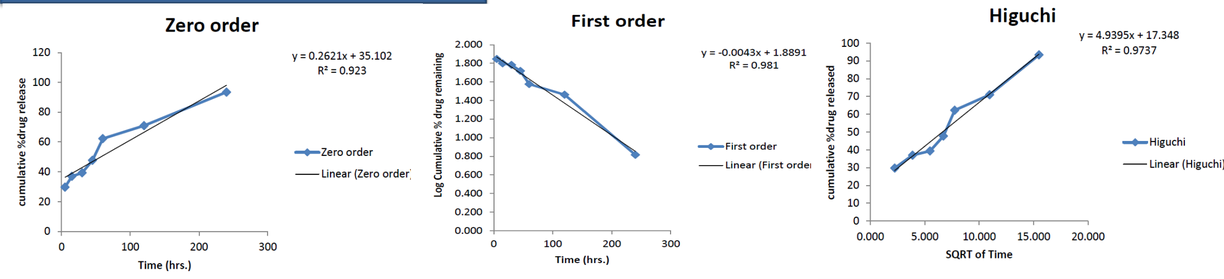




### ENCAPSULATION EFFICIENCY AND LOADING CAPACITY

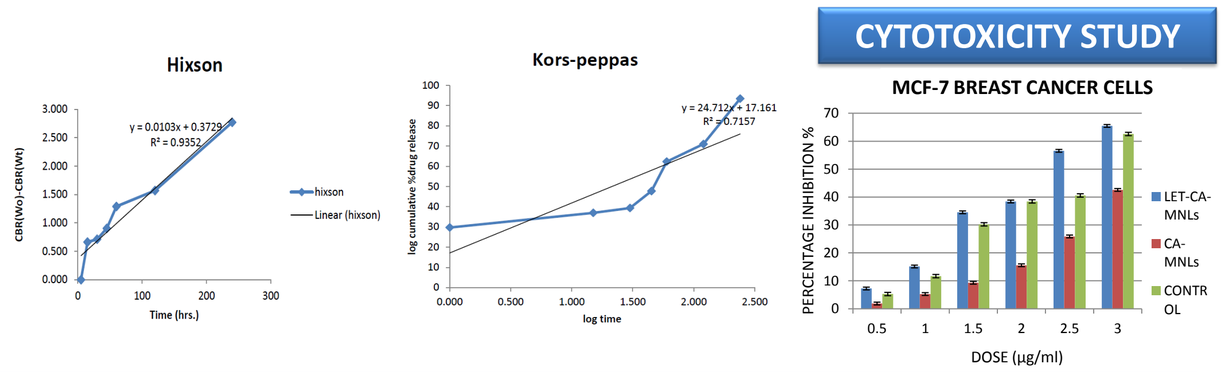



### DRUG RELEASE KINETICS




### CYTOTOXICITY STUDY




## CONCLUSION

Liposomal nanocarriers promote targeted responses and iron oxide nanoparticles create an onsite action and lower the toxicity associated with unwanted biodistribution. Based on the results from pharmaceutical characterizations, the developed formulation is fit for targeted drug delivery applications.

## FUTURE WORK / REFERENCES

Further *invivo* studies will be carried out to assess the anticancer efficacy of developed formulation.