3

The influence of lysozyme in the structural features of cubosomes: a potential drug delivery system

Amanda S. Palma[1] , Mayra C. G. Lotierzo [2] , Bruna R. Casadei[1] and Leandro R. S. Barbosa[1] *

[1]*Institute of Physics, University of São Paulo, São Paulo, Brazil*

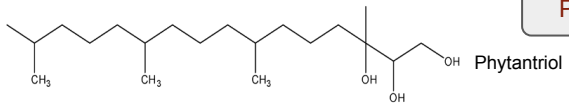
[2] *Department of Biochemical and Pharmaceutical Technology, University of São Paulo, São Paulo, Brazil*

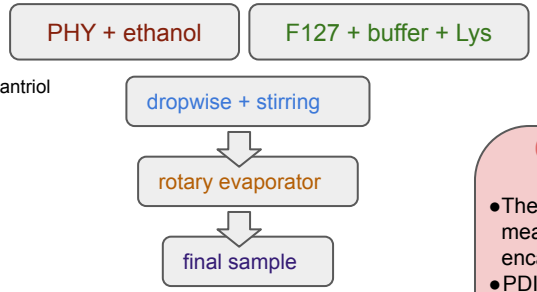
amanda_sp@usp.br

Introduction

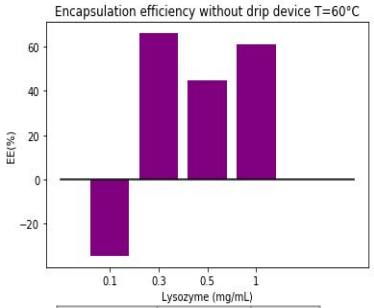
Lysozyme (*Lys*) is a compact protein (14,400 kDa) that has bactericidal properties. Lysozyme loaded into cubosomes (*cubs*) make a nanosystem that can be used as an antibiotics. In this study, we aimed to study cubosomes loaded with lysozyme. These nanoparticles were produced with phytantriol (*PHY*) and Pluronic F127 (*F127*) in the presence of Hepes buffer (pH 7.4). To characterize Lys-PHY-cub system, we measured the hydrodynamic diameter (*z-average*), polydispersity index (*PDI*) and encapsulation efficiency (*EE%*). The results indicate that F127 can interfere in the EE% calculation by measuring the absorbance spectrum.

Methods

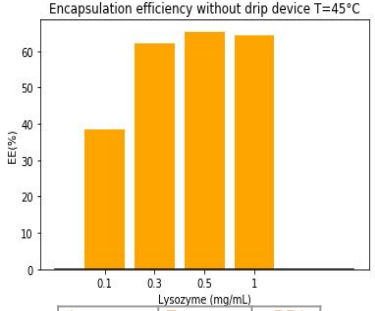




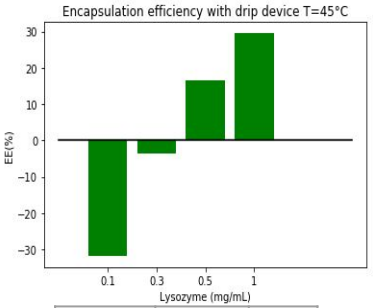
Results



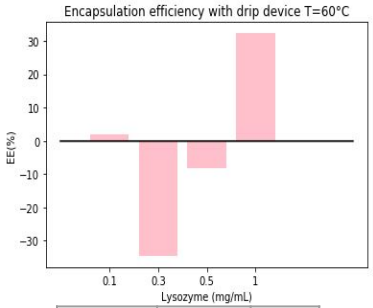
Lysozyme (mg/mL)	Z-average (nm)	PDI
0	278.2	0.130
0.1	282.2	0.103
0.3	246.2	0.098
0.5	315.8	0.051
1	269.4	0.104



Lysozyme (mg/mL)	Z-average (nm)	PDI
0	303.1	0.043
0.1	275.4	0.141
0.3	301.8	0.097
0.5	263.3	0.116
1	308.1	0.074



Lysozyme (mg/mL)	Z-average (nm)	PDI
0	268.6	0.063
0.1	366.6	0.103
0.3	379.7	0.092
0.5	301.8	0.106
1	351.1	0.078



Lysozyme (mg/mL)	Z-average (nm)	PDI
0	300.6	0.079
0.1	320.8	0.103
0.3	304.1	0.055
0.5	496.7	0.112
1	399.9	0.163

Conclusions

- The Polymer interfered in the measurement of encapsulation efficiency;
- PDI results were around 0.1 (monodisperse);
- Hydrodynamic diameter is consistent for all samples;
- Temperature influences z-average and encapsulations efficiency.

Acknowledgments:

FAPESP – Fundação de Amparo à Pesquisa do Estado de São Paulo

CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico