The catalytic action of low molecular weight surfactant aggregates is a well known phenomenon and has been already handled through rigorous models. In this case, the emergence of a less polar subphase and a surface that condense ionic species (for example) usually cause the acceleration of chemical reactions, sometimes by factors close to those observed in enzymatic catalysis. A similar kind of aggregates can be obtained with certain types of polymers. Those macromolecules of high molecular weight are very easily synthesized from smaller structural units (monomers) and show different colloidal and chemical behavior, as well as biocompatibility, when compared to common surfactants. Besides, those properties are still to be fully accessed. In particular, aggregates of PMMA-b-DMAEMA, a diblock copolymer of methyl metacrylate, MMA, and N, N dimetilaminoethyl metacrylate DMAEMA, obtained by Controlled Radical Polymerization and having two well defined blocks (one relatively apolar) were studied here in aqueous solutions, focusing their interaction with large unilamellar vesicles, LUVs, prepared by extrusion of egg-phosphatidyl-choline, PC, egg-phosphatidyl-glycerol, and PG mixtures, yielding vesicles with 100nm diameter, used as cell mimetic systems. Those were loaded with carboxifluorescein (CF) 50 mM. At this concentration CF is self-quenched. Non-entrapped CF was removed through a Sephadex-G25 column.

**Results:** PMMA-b-DMAEMA is positively charged at pH 7 and interacts with negatively charged PC/PG-LUVs causing CF leakage and fluorescence signal to increase. The percentage of CF leakage, %L, from LUVs of PC:PG, 1:1 molar ratio, at a defined time, increased with the copolymer concentration until a concentration of 4.0 mg / mL. Above this concentration 100% of CF is released after 100 s. The %L also increased with the %PG in the lipid mixture, indicating the influence of charge density on the leakage. The positively charged PMMA-b-DMAEMA acts like several antimicrobial peptides besides its structure simplicity. We are now changing the distance between the amine groups in order to establish a clear correlation between charge distance and vesicle leakage.

**Keywords:** diblock copolymer, membrane, vesicles.

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