

Study and characterization of multilayer biocompatible polyelectrolyte films using phospholipid liposomes

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The layer-by-layer (LbL) methodology is based on the spontaneous absorption of opposite charged polyelectrolyte monolayer [1]. Liposomes are ordered structures arranged in closed spherical membranes with diameter ranging from 25 nm to many microns (multilamellar vesicles). In addition, they are able to entrap water-soluble solutes in the aqueous inner core [2]. In this sense, we investigated the growth of multilayers films (PEI/liposomes)_n, alternating layers of PEI (poly(ethyleneimine) as positively charged and liposomes as negatively charged polyelectrolyte counterpart. We have used a 0,5 g.ml⁻¹ solution of PEI (MW=25,000 g.mol⁻¹) purchased from Sigma-USA. Liposomes were prepared by hydration of a lipidic film with 0.2 mg. mL⁻¹ chloroform solution in Tris-buffer followed by sonication. The lipids used, dipalmitoylphosphatidylglycerol (DPPG), were purchased from Avanti Polar Lipids (USA). The deposition process of resultant multilayers was monitored by UV and FTIR spectroscopy and plots of absorbance versus number of bilayers showed a linear increase of films, Figure 1. Neutron reflectivity measurements were used to investigate the morphology and stability of liposomes in LbL films. The thickness of the liposome layer calculated from fitting the results was consistent with the value estimated for the liposomes in solution (~ 50 nm). Incoming studies will investigate the immobilization of liposomes in the system proposed and also the biocompatibility of the multilayers with fibroblast cells. the liposomes in a controlled way.

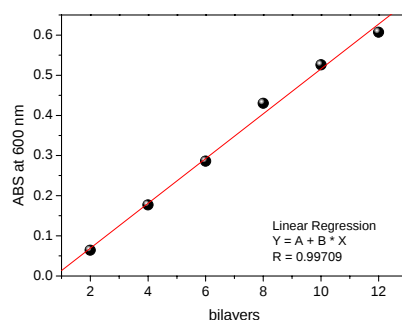


Figure 1 Linear dependence of the absorbance at 600 nm versus number of bilayers

Keywords: polyelectrolyte multilayer, liposome, immobilization and fibroblast cells

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