



**VII CONGRESSO NAZIONALE DI
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EFFECT OF LAYER BY LAYER DEPOSITION ON THE MORPHOLOGY AND THE STABILITY OF POPC-DODAB LIPOSOMES

G. Angelini^a, S. Boncompagni^b, M. D'Este^c, A. Fontana^a, C. Gasbarri^a, E. Menna^c, G. Siani^a

^aDip. Scienze del Farmaco, Università "G.d'Annunzio", via dei Vestini n° 31, Chieti^bLaboratorio di Fisiologia Cellulare, CeSI, Università "G.d'Annunzio", via dei Vestini n° 31, Chieti^cDip. di Scienze Chimiche, Università degli Studi di Padova, via Marzolo n° 1, Padova c.gasbarri@unich.it

The encapsulation process is based on the sequential deposition of oppositely charged polyelectrolytes on a colloidal template. The number of adsorbed layers and the type of interaction between the first deposited polyelectrolyte and the template have a preminent importance in determining the size and the stability of the nanocapsules.

Zwitterionic liposomes formed by 1-palmitoyl-2-oleoyl-phosphatidylcholine (POPC) were prepared by hydration of a dry film using phosphate buffer at pH 7.4. An appropriate amount of dioctadecyldimethylammonium bromide (DODAB) has been inserted into the liposomal bilayer in order to positively charge the vesicles surface and increase the polyelectrolytes deposition.

Poly-styrenesulphonate sodium salt (PSS), poly-allylamine hydrochloride (PAH) and shortened single-walled PEG grafted carbon nanotubes (sh-SWNT-PEG) have been alternatively adsorbed onto POPC-DODAB liposomes to obtain nanocapsules coated with different kind and number of layers. PSS and sh-SWNT-PEG adsorb on the POPC-DODAB template by both electrostatic and hydrophobic interactions, while interactions of PAH with liposomes are essentially electrostatic. The morphology of coated liposomes has been investigated by using electron and optical microscopy. The increase of nanocapsule stability due to the coating has been determined by measuring spectrophotometrically the rate of the liposome breakdown induced by the addition of the non-ionic surfactant octaethyleneglycol mono-n-dodecyl ether (C₁₂E₈).