Interaction of new fluorescent 2-quinolinone and coumarin derivatives with phospholipid monolayers and lipid vesicles

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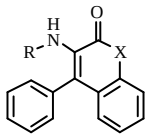
Molecular interactions between organic molecules and phospholipids of various chain lengths have been investigated, either with monolayers at the air-interface or with bilayer vesicles (liposomes) as models of cell membranes [1]. In the present work, the interaction with biomembrane models of a fluorescent 3-amino-4-phenylquinolin-2-one **1** and a 3-(*tert*-butoxycarbonyl)amino-4-phenylcoumarin **2** (Fig. 1), previously synthesized by us [2], were studied. Interactions of both compounds with phospholipid monolayers of egg-yolk phosphatidylcholine (Egg-PC), dipalmitoyl phosphatidylcholine (DPPC) and dipalmitoyl phosphatidylglycerol (DPPG) has been studied by the Langmuir-Blodgett technique (Fig. 2).



1. R = H, X= NH
2. R = Boc, X= O

Figure 1. Structure of compound **1** and **2**.

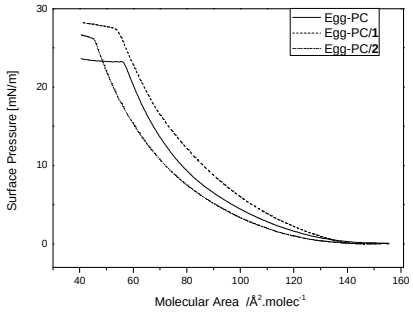


Figure 2: Surface pressure/molecular area isotherms of Egg-PC, Egg-PC/**1** and Egg-PC/**2** at the air-water interface at 22 ºC.

Fluorescence emission and anisotropy measurements of **1** and **2** in lipid vesicles were performed below (gel phase) and above (liquid-crystalline phase) the lipid melting transition temperature (Table 1) in order to obtain information about compound interactions with the lipid membranes.

Table 1. Steady-state fluorescence anisotropy (*r*) values and maximum emission wavelengths (λ_{em}) for compounds **1** and **2** in lipid membranes.

Lipid Membranes	T (ºC)	**1**		**2**	
		λ_{em}/nm	*r*	λ_{em}/nm	*r*
Neat Egg-PC	25	398	0.088	399	0.216
Neat DPPC	25	398	0.059	400	0.164
	55	398	0.045	400	0.149
Neat DPPG	25	394, 509 *sh*	0.023	400	0.146
	55	394, 503 *sh*	0.012	398	0.119
DPPC/DPPG (1:1)	25	394, 500 *sh*	0.025	397	0.177
	55	397, 502 *sh*	0.012	396	0.157

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