FLUORESCENCE STUDIES OF BENZOTHIENOQUINOLINES IN LIPID MEMBRANES

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Benzothieno[3,2-*b*]quinoline **1** and benzothieno[2,3-*c*]quinoline **2** are known for their anti-plasmodic and anti-infectious activities, acting mainly through intercalation between DNA base pairs when used in their salt form [1]. Normally synthesized by two separated reactions, our group was able to obtain the two compounds in a single reaction.

In this work, we present fluorescence studies of compounds **1** and **2** in several solvents and when incorporated in lipid membranes of dipalmitoyl phosphatidylcholine (DPPC), dimyristoyl phosphatidylethanolamine (DMPE), egg yolk phosphatidylcholine (Egg-PC) and dioctadecyldimethylammonium bromide (DODAB). The fluorescence emission of both compounds shows a completely loss of vibrational structure and a pronounced red shift in polar solvents (48 nm and 28 nm between cyclohexane and water for compound **1** and **2**, respectively), indicating that these compounds may be used as solvatochromic probes.

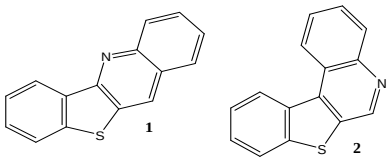

Figure 1. Structure of compounds **1** and **2.**

Fluorescence anisotropy measurements of the benzothienoquinolines encapsulated in liposomes indicate that both compounds are located inside the lipid bilayer, feeling the penetration of some water molecules. Compound **2** generally prefers a less hydrated environment. Upon transition from the gel phase to the liquid-crystalline phase in DMPE and DODAB vesicles, a change in location of both compounds to more hydrated environments is observed, especially for compound **1**. These studies may be important to future drug delivery applications of these potential biologically-active compounds using liposomes in order to reduce toxic effects or to increase drug circulation time [2].

[1] X.Y. Zhou, L.G. Mardenborough, S. Li, A. Khan, W. Zhang, P. Fan, M. Jacob, S. Khan, L. Walker, S. Y. Ablordeppey, *Bioorg. Med. Chem.* 15 (2007) 686-695
[2] R. Banerjee *J. Biomater. Appl.* 16 (2001) 3-21

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