

# SPIN LABELLED LIPOSOME MEMBRANES

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Lipid vesicles are of general interest for pharmaceutical industry due to their ability to incorporate hydrophilic and hydrophobic molecules. When these properties are coupled with their biocompatibility it is hoped that they can be used as drug delivery systems.

Due to its high sensitivity, wide range of analysable systems and mildness of the technique, EPR has demonstrated its capabilities in probing the properties of the microenvironment of these supramolecular entities.<sup>1</sup>

The aim of this project is the analysis of intramolecular interactions between spin probes in diradical systems incorporated into the vesicle bilayer (Figure 1).

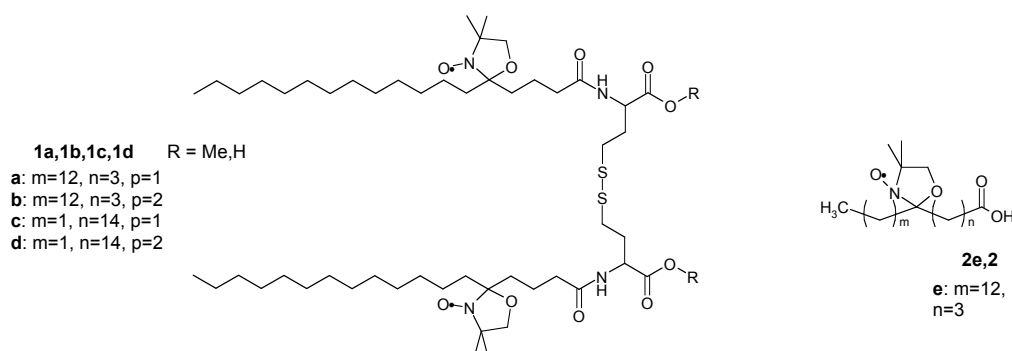


Figure 1: spin labels

We have synthesised esters **1a** and **1b** and recorded EPR spectra for these molecules in solution. This analysis showed an exchange interaction between the two radicals (arrowed in Figure 2).

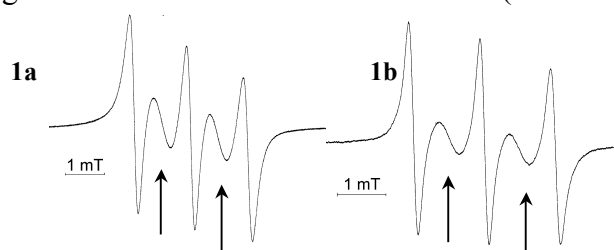


Figure 2: EPR spectra of **1a** and **1b** in CH<sub>2</sub>Cl<sub>2</sub>

Preliminary results showed that the process of inclusion of fatty acid chains into vesicles membrane can be achieved effectively as shown in Figure 3. These EPR spectra show reduced mobility of the membrane-embedded spin labels.

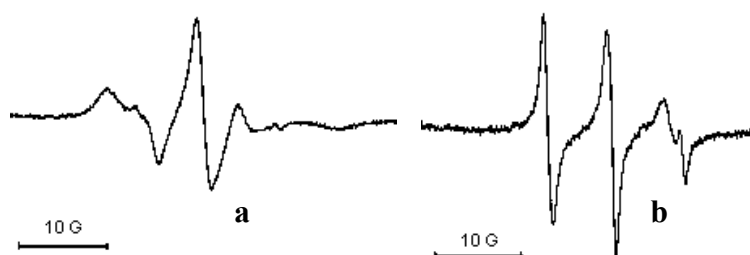


Figure 3: EPR spectra of (a) spin label **2e** in vesicle at rt, (b) spin label **2f** in vesicles at rt

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<sup>1</sup> J. Kristal, et al.; *International Journal of Pharmaceutics*, **2003**, 256, 133; B. G. Dzikovski; et al.; *Phys. Chem. Chem. Phys.*; **2003**, 5, 5271; G. Martini; et al.; *Journal of Fluorine Chemistry*, **2004**, 125, 253; N. Deo; et al.; *Journal of Colloid and Interface Science*; **2002**, 256, 100; H. Fukuda; et al.; *Langmuir*, **2001**, 17, 4223