We have previously observed that below the main phase transition ceramides form crystalline phases when mixed with cholesterol (Chol) [1]. These crystal phases may, when melted, generate transient structures that have been frequently discussed and proposed as precursors of the so-called “lipid rafts”. However, no crystalline structures have ever been observed for the typical lipid components of the cellular plasma membrane, palmitoyl-oleoyl-phosphatidylcholine (POPC) and sphingomyelin (SpM) mixed with cholesterol (Chol). The fact is that, the binary phase diagrams for POPC:Chol and SpM:Chol are both only sketched for a very short range of temperature and composition. Suspecting that if crystalline phases for these mixtures exist they will appear at temperatures well bellow 0 °C, a sample-holder has been developed allowing simultaneous SAXS and WAXS measurements of capillary encapsulated samples for temperatures attaining –25 ºC. Preliminary phase diagrams were obtained shown in Figure 1.

Figure 1: Preliminary phase diagrams for the binary mixtures: a) POPC:Chol, and b) SpM:Chol.

References


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