quickly and more precisely, showing that the coupling affects the dynamics. This leaflet coupling is found to heavily influence morphological evolution; in some cases the equilibrium morphological phase observed is very different from what was observed with our simpler monolayer model using similar conditions. We construct a phase diagram of equilibrium morphological phases in the composition space for a few values of the strength of the leaflet coupling. This model has been able to reproduce results found in lipid bilayer experiments probing interleaflet interactions, including the effect of domain registration across leaflets. For the vesicle model, we investigate how an ellipsoidal geometry imposed in the initial conditions affects the phase and morphological evolution.

1821-Pos Board B665
The Ionic State Of Ceramide 1-phosphate Affects Raft Domain Morphology and Fluidity
Zhiping Jiang, Arne Gericke.
Kent State University, Kent, OH, USA.
Ceramide 1-phosphate (Cer1P) is involved in cell survival, cell proliferation, inflammation and phagocytosis processes. Physiological processes that have been associated with Cer1P have been shown to be in some cases lipid raft dependent. Lipid rafts are proposed to exist in a liquid-ordered state and it has been suggested that raft domains are involved in a variety of important biological processes. It has been shown that ceramide forms gel phase domains within the liquid-ordered raft domains and the question arises what kind of phase state Cer1P adopts when immersed in a raft domain. The physicochemical behavior of Cer1P is mainly routed in the protonation state of the phosphate headgroup. To investigate the phase behavior of Cer1P in raft domains, giant unilamellar vesicles (GUVs) composed of POPC/Sphingomyelin/Chol (1:1:1) with different concentrations of Cer1P were studied by fluorescence microscopy at buffers with different pH (pH5, pH7 and pH9). For a pH 7 buffer, the presence of Cer1P disrupted raft domains and induced lipid phase reorganization and the appearance of a Cer1P-enriched gel phase. In contrast to the large platforms reported for ceramide, the presence of Cer1P disrupts rafts. For pH 5 buffer, with increasing concentrations of Cer1P, the domain patterns were totally different from those observed for pH 7 buffer. The Cer1P gel phase disappeared completely and the raft type liquid disordered phase became dominant. In pH 9 buffer, the ability of Cer1P to disrupt rafts was attenuated. These experiments demonstrate that the protonation state of the phosphate headgroup affects the phase behavior of Cer1P within the raft. The headgroup of Cer1P might function as an electrostatic switch that drives the lipid in and out of gel phase domains which may modulate its availability to the relevant proteins.

1822-Pos Board B666
Interdigitation, Domains and Morphology, in Membranes of the Chain Asymmetric C24:1 Ceramide
Sandra N. Panto1, Liana C. Silva1, Rodrigo F.M. de Almeida2, Manuel Prieto3.
1Centro de Quimica-Fisica Molecular and IN, Lisbon, Portugal.
2Centro de Quimica e Bioqumica, Faculdade de Ciencias, UL, Lisbon, Portugal.
Ceramide (Cer) is involved in the regulation of several biological processes, such as apoptosis and cell signaling. The alterations induced by Cer in the biological properties of membranes are thought to be one of the major routes of Cer action. To gain further knowledge about the alterations induced by Cer, membrane reorganization by the very long chain asymmetric nenvonoylceramide (NCer) was studied. The application of an established fluorescence multitrue approach, together with x-ray diffraction, differential scanning calorimetry, and confocal fluorescence microscopy, allowed the characterization of NCer and the determination of the phase diagram of palmitoyloleylophosphatidylcholine (POPC)/NCer binary mixtures. Nenvonoylceramide is proposed to exist in a transition from a mixed interdigitated gel phase to a partially interdigitated gel phase at 20°C, and a broad main transition to the fluid phase at 52°C. The solubility of NCer in the fluid POPC is low, driving gel-fluid phase separation, and the binary-phase diagram is characterized by multiple and large coexistence regions between the interdigitated gel phases and the fluid phase. At 37°C, the relevant phases are the fluid and the partially interdigitated gel. Moreover, the formation of NCer interdigitated gel phases leads to the formation of coexistence type tubular structures.

1823-Pos Board B667
Interaction of Antimicrobial Oligomers with Lipids Studied by Solid-State NMR
Weiguo Hu, Abhigyan Som, Gregory N. Tew.
University of Massachusetts, Amherst, MA, USA.
A family of synthetic mimics of antimicrobial peptides (SMAMP), amphiphilic meta-phenylene ethynylene (mPE) molecules show a wide range of antimicrobial activity and specificity. The interaction of a specifically active mPE molecule (AMO-2) with mixed DOPE/DOPG lipid was studied by solid-state NMR. The AMO-2 molecules do not preferentially interact more strongly with either lipid component, but rather are well dispersed in the lipid matrix. AMO-2 interacts with all parts of lipid molecules, including head groups. Magic-angle spinning sideband analysis indicated that in samples with co-existing lamellar and inverted hexagonal phases (H2), neither lipid component aggregate in either phase. The presence of AMO-2 molecules causes dynamic disorder in lipid head groups, as evidenced by the broadening of both static and MAS 31P spectra. AMO-2 molecules do not massively transform the lamellar lipid into H2 phase.