Table S1 – Summary of the different experimental conditions tested throughout this work, including the lipid mixtures that were investigated and the main observations obtained for each system studied.

Lipid System	**Hepes 10mM, pH 7.4**	**Vesicles size**	**Solid support**	**Lipid film**
DOPC/DPPC (1:1)	+ 150mM NaCl, 5mM $CaCl_2$	SUV's	Unmodified gold	Tubules
	+ 5mM $CaCl_2$	SUV's	Unmodified gold	Planar bilayer, no lipid domains
	No salt	SUV's	Unmodified gold	Planar bilayer with lipid domains
DOPC/DPPC/Chol (2:2:1)	+ 150mM NaCl, 5mM $CaCl_2$	SUV's	Unmodified gold	Tubules
	+ 5mM $CaCl_2$	SUV's	Unmodified gold	Planar bilayer with lipid domains, presence of vesicles
	No salt	SUV's	Unmodified gold	Planar bilayer with lipid domains, undulations
			Mica	Planar bilayer with lipid domains
		LUV's	Unmodified gold	Planar bilayer with lipid domains, undulations
			MUA modified gold	Planar bilayer with lipid domains
DOPC/DPPC/Chol (2:2:1) + 10% GM_1	+ 150mM NaCl, 5mM $CaCl_2$	SUV's	Mica	Planar bilayer with three types of domains
	No salt		Unmodified gold	Planar bilayer with pores

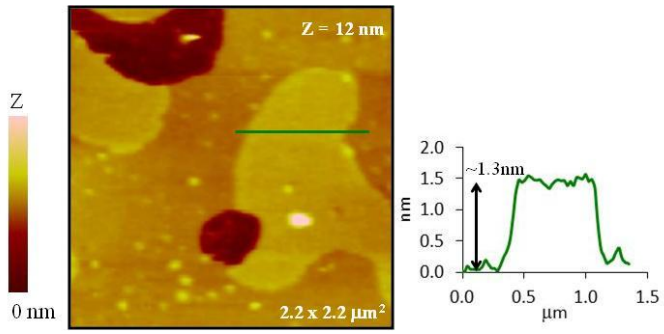

Fig. S1 - AFM image of a DOPC/DPPC (1:1) lipid bilayer on mica with gel (thicker) and fluid (thinner) domains, differing in height by approximately 1.3 nm. The image was obtained by *tapping mode* AFM in buffer solution at room temperature and the topographical profile shown corresponds to the colored line drawn.

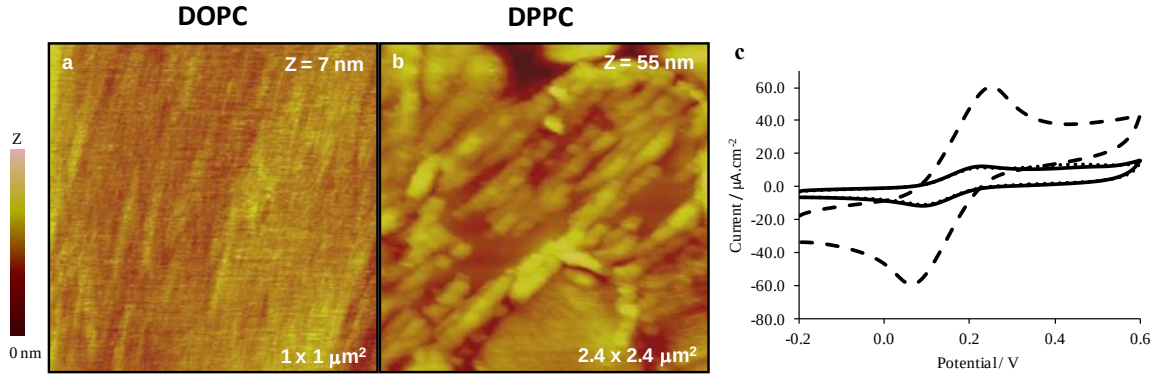

Fig. S2 - AFM images of pure DOPC a) and DPPC b) lipid films deposited on gold from SUV, using hepes buffer without added salt. DOPC (fluid at room temperature, T_m = - 20 ºC) forms a continuous and planar lipid film with a corrugation pattern assignable to a single lipid bilayer, while DPPC (gel at room temperature, T_m = 41 ºC) generates mostly lipid tubules surrounded by planar regions. In neither situation phase separation is observed. These studies highlight the importance of having binary or ternary lipid mixtures to be able to form stable bilayers directly on unmodified gold, containing ordered lipid domains. The blocking effect to the $K_3Fe(CN)_6$ redox process is also shown for pure lipid films in c). An almost complete suppression of the $K_3Fe(CN)_6$ redox signal indicates a high coverage of the gold electrode for both systems. – – – Bare gold — DPPC ····· DOPC.

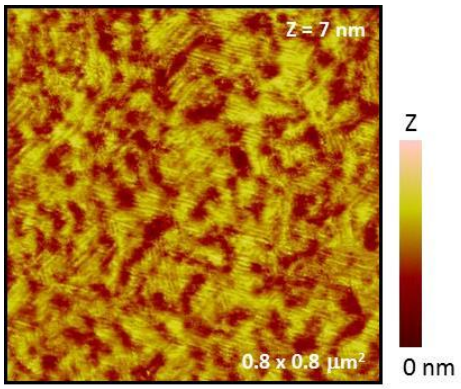

Fig. S3 - *Tapping mode* AFM image (obtained in a liquid cell) of a DMPC bilayer on Au (111), prepared from SUV deposition in Hepes buffer with no salt. Corrugations, with an average periodicity of ~5.3 nm, are clearly depicted. The observed heterogeneity corresponds probably to gel and fluid coexistence as the imaging was performed at room temperature (21ºC) within the main phase transition temperature-range of DMPC SLB.

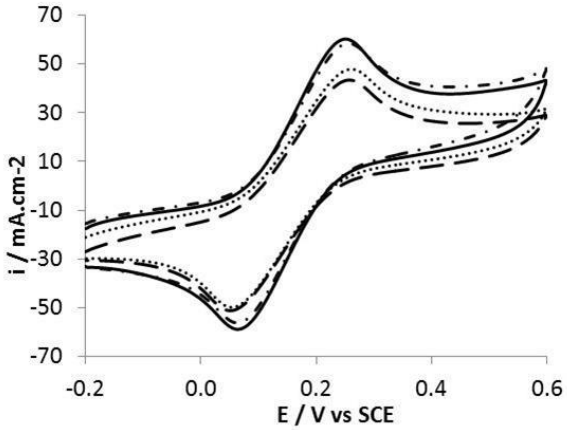

Fig. S4 – Successive cyclic voltammograms recorded at 50 mVs^{-1} of 1 mM $K_3Fe(CN)_6$ in 50 mM Hepes buffer on gold modified with lipid films of DOPC/DPPC/Chol (2:2:1)/GM1 (10%) prepared in Hepes buffer in the absence of salt. With the successive scans the lipid film is detached from the gold surface which becomes more exposed leading to an increase of the peak current intensity. ── Bare gold – – – first scan ····· second scan –·–· third scan.