Supporting Material

Molecular model for the solubilization of membranes into nanodiscs by styrene maleic acid copolymers

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Figure S1

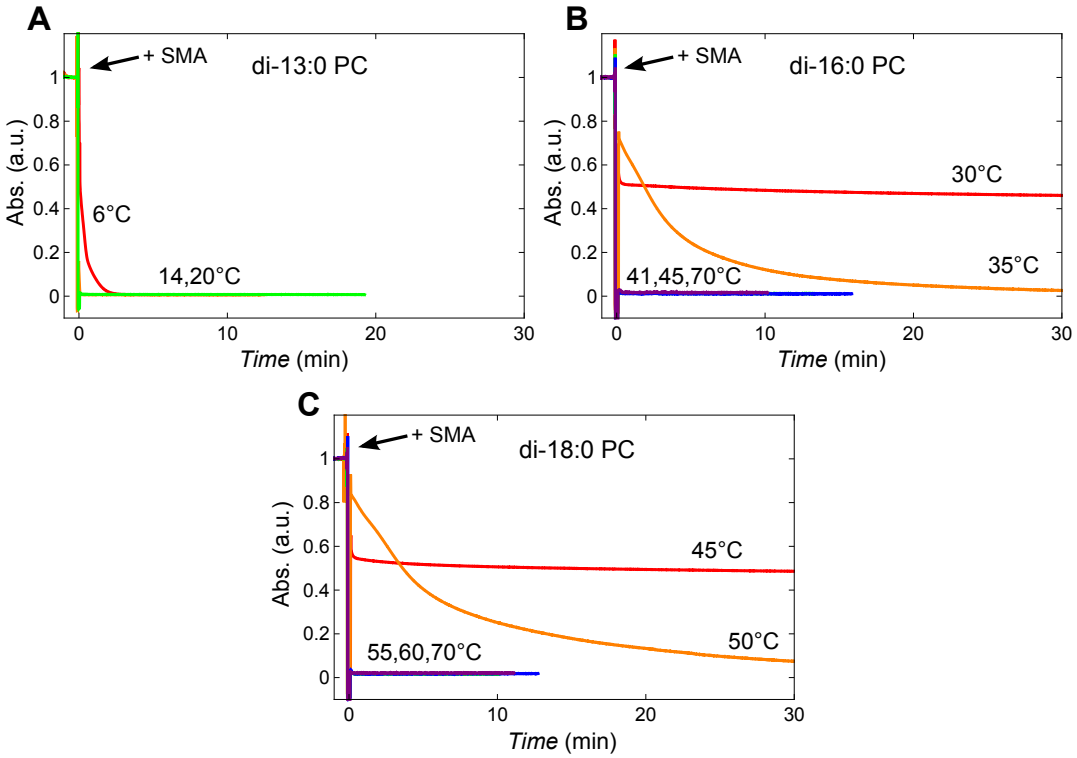

Figure 1: Kinetics of solubilization of saturated PC lipid vesicles (400 nm) induced by the SMA copolymer at a 3:1 (w/w) SMA to lipid ratio. Normalized time traces of the absorbance at 350 nm showing the kinetics of solubilization of (*A*) di-13:0 PC (T_m= 14 °C), (*B*) di-16:0 PC (T_m= 41 °C), and (*C*) di-18:0 PC vesicles (T_m= 55 °C). T_m values are taken from (1).

Figure S2

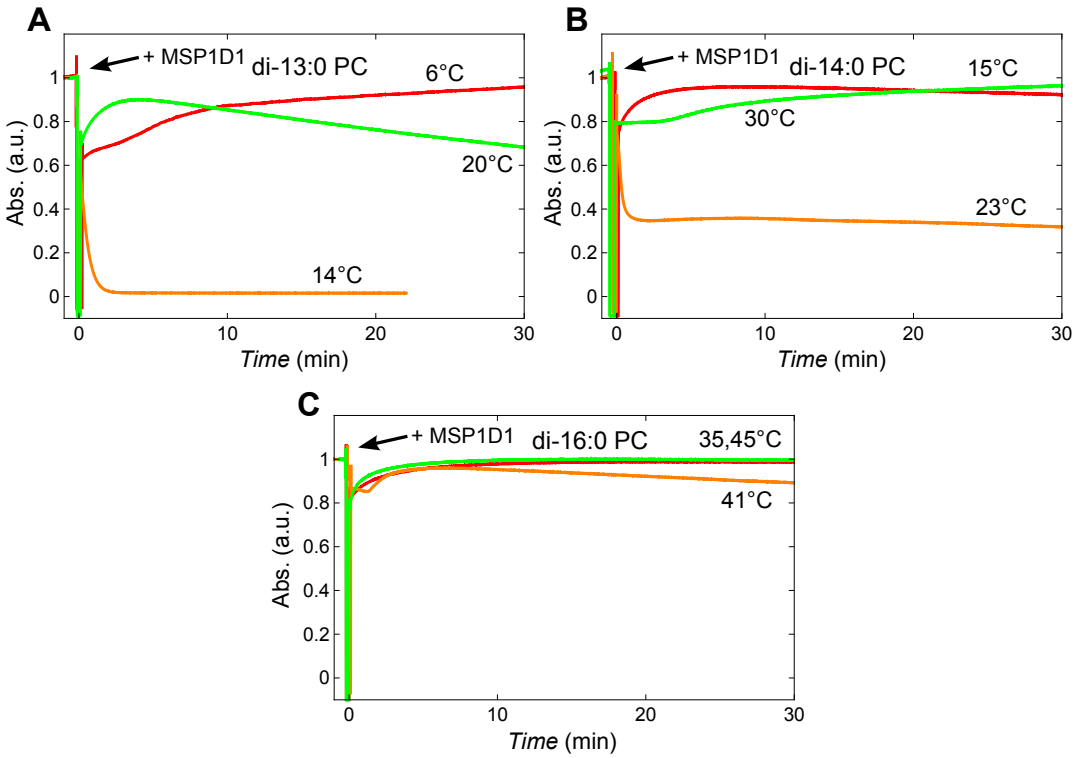

Figure 2: Kinetics of solubilization of saturated PC lipid vesicles (400 nm) induced by the membrane scaffold protein MSP1D1 at a 1:1 (w/w) protein to phospholipid ratio. Normalized time traces of the absorbance at 350 nm showing the kinetics of solubilization of (*A*) di-13:0 PC (T_m= 14 °C), (*B*) di-14:0 PC (T_m= 23 °C), and (*C*) di-16:0 PC vesicles (T_m= 41 °C).

Figure S3

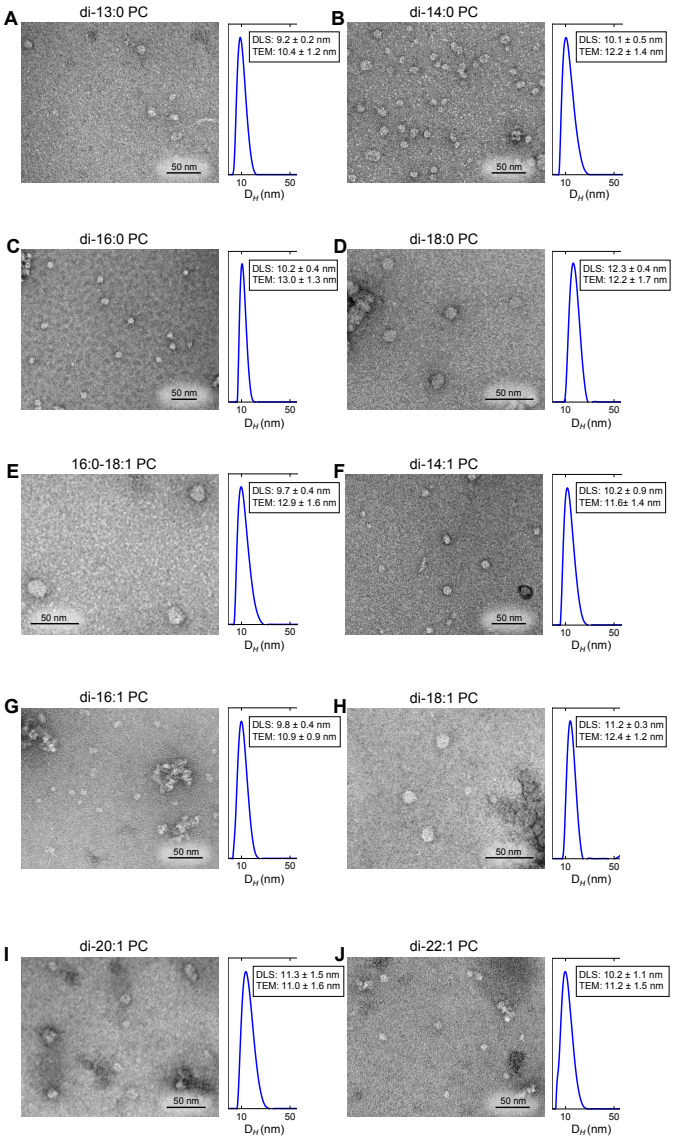

Figure 3: Negative staining transmission electron microscopy (TEM) images and dynamic light scattering (DLS) data on nanodiscs of saturated and unsaturated PC lipids. The average diameter and standard deviation found by TEM is based on the analysis of 20 individual nanodiscs. Scale bars are indicated. Aggregation of nanodiscs and uranyl acetate stain were sometimes found in the samples (for example in panel D and G) and were likely to be induced by drying effects. Aggregates were not considered for analysis. The average diameter and standard deviation found with DLS is based on multiple measurements on single independent samples as described in the method section.

Figure S4

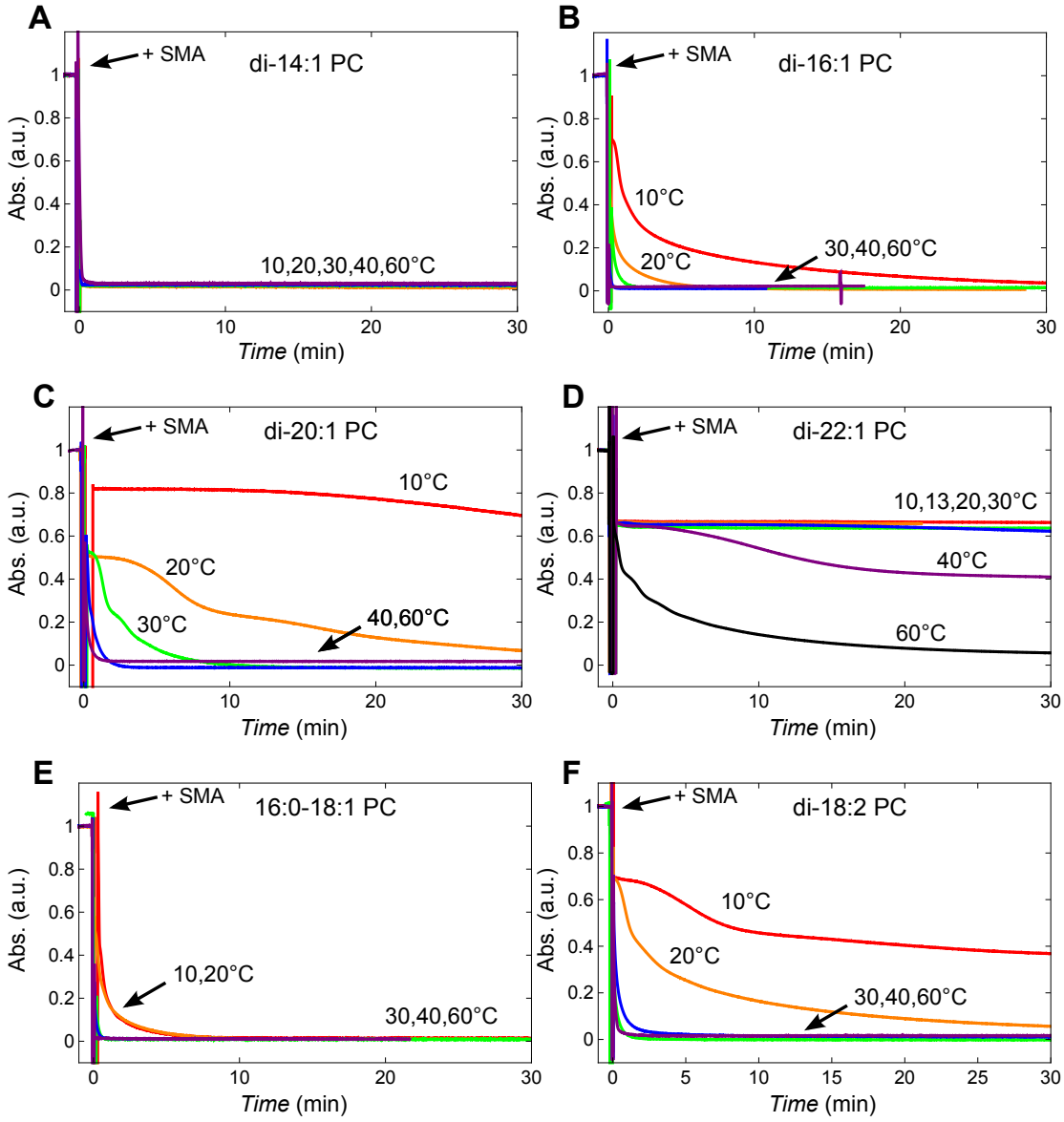

Figure 4: Kinetics of solubilization of unsaturated lipid vesicles (400 nm) induced by the SMA copolymer at a 3:1 (w/w) SMA to lipid ratio. Normalized time traces of the absorbance at 350 nm showing the kinetics of solubilization of (*A*) di-14:1 PC, (*B*) di-16:1 PC (T_m= -36 °C), (*C*) di-20:1 PC vesicles (T_m= -4 °C), (*D*) di-22:1 PC (T_m= 13 °C), (*E*) 16:0-18:1 PC (T_m= 2 °C), and (*F*) di-18:2 PC (T_m= -57 °C).

Figure S5

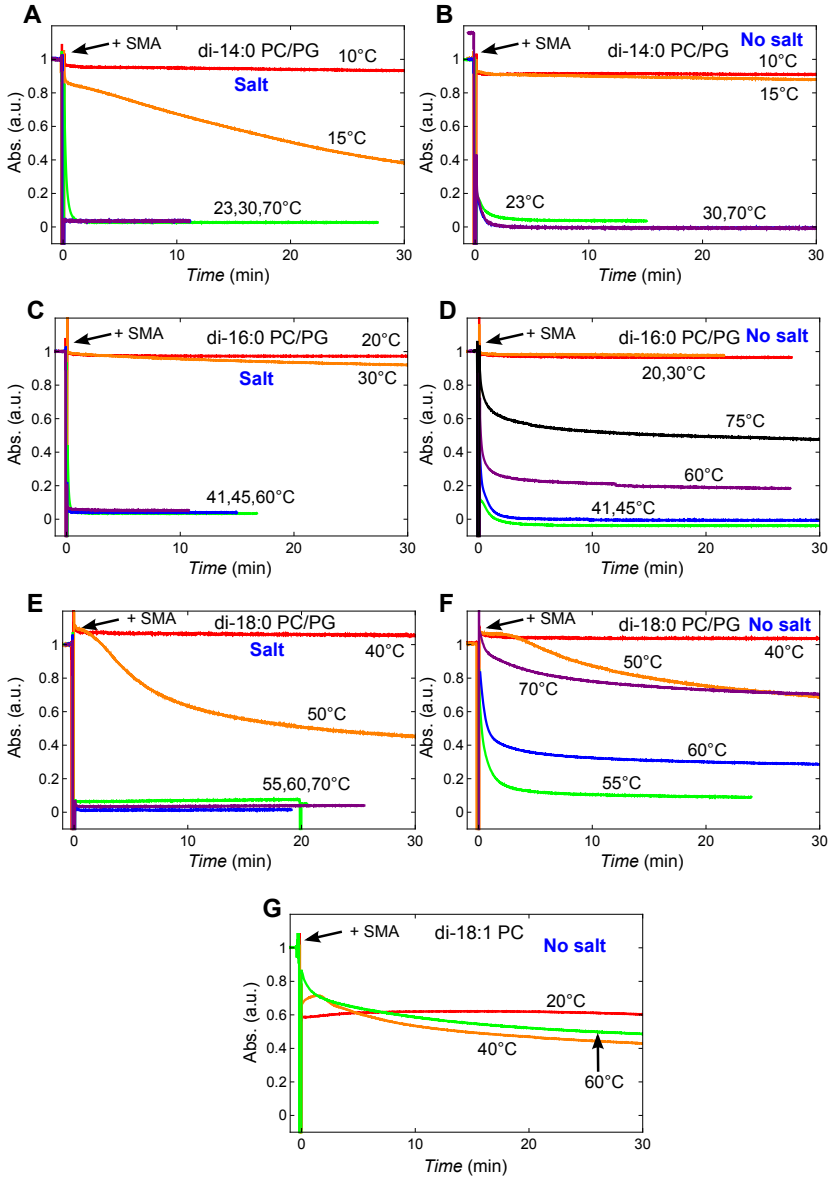

Figure 5: Kinetics of solubilization of saturated PC/PG (4:1) mol lipid vesicles (400 nm) and di-18:1 PC lipid vesicles in the absence of salt induced by the SMA copolymer at a 3:1 (w/w) SMA to lipid ratio. Normalized time traces of the absorbance at 350 nm showing the kinetics of solubilization of (*A*), (*B*) di-14:0 PC/PG (T_m= 23°C), (*C*), (*D*) di-16:0 PC/PG (T_m= 41°C), (*E*), (*F*) di-18:0 PC/PG (T_m= 55°C), and (*G*) di-18:1 PC (T_m= -20°C) in the presence and absence of salt, respectively.

Figure S6

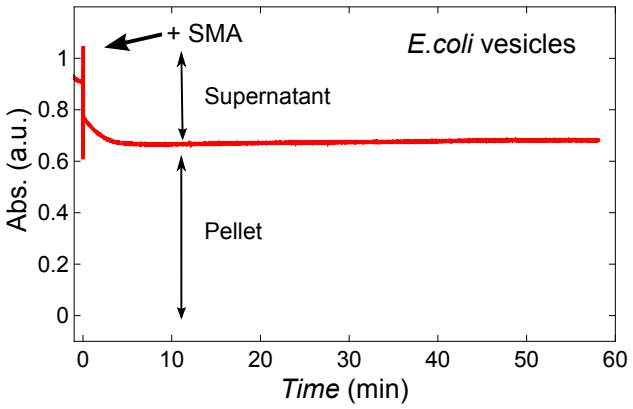

Figure 6: Partial solubilization of vesicles (400 nm) upon the addition of the SMA copolymer at a 1.4:1 (w/w) SMA to lipid ratio at 20°C. Normalized time trace of the absorbance at 350 nm. Supernatant and pellet were obtained after centrifugation as described in the method section.

Figure S7

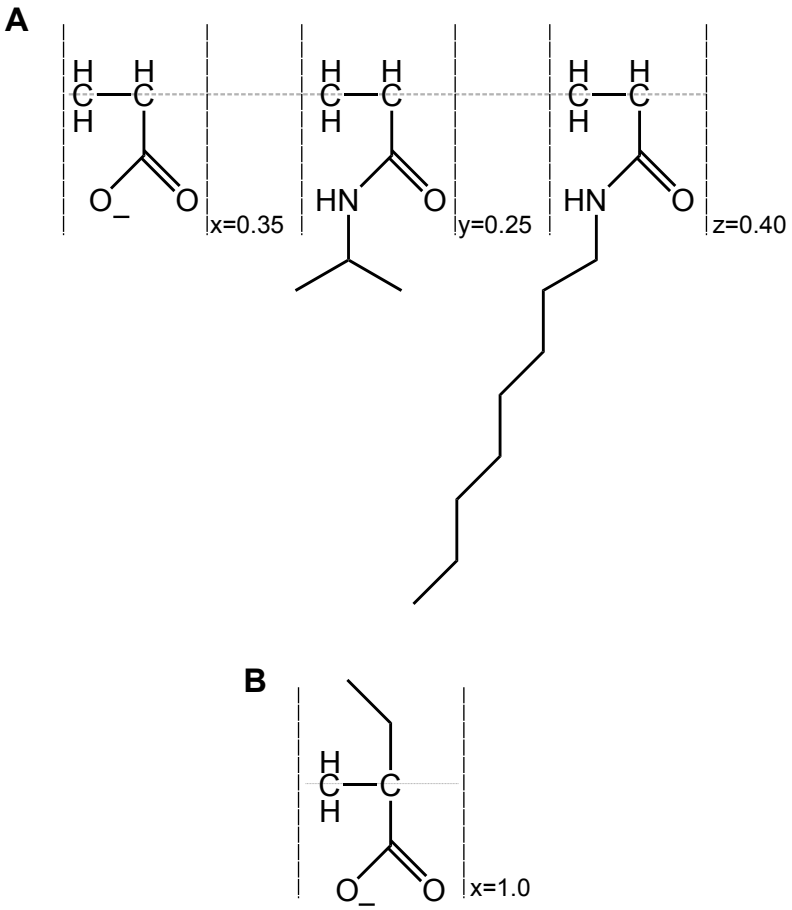

Figure 7: Chemical structures of (*A*) Amphipol A8-35 and (*B*) PEAA.

Supporting References

[1] Silvius, D. J. R., 1982. Thermotropic phase transitions of pure lipids in model membranes and their modifications by membrane proteins, volume Lipid-Protein Interactions. John Wiley & Sons, Inc. New York.