Fig. S1. 1D $^1$H spectra of apelin-13 (Ap13) and apelin-17 (Ap17) in the presence of q=0.5 DMPC:DHPC (PC) and DMPC:DMPG:DHPC (PC-PG) bicelles acquired at 37 °C. Peptide (0.5 mM) signals are obscured by much larger signals from the lipids (150 mM).
Fig. S2. 1D $^{31}$P solid-state NMR spectra of magnetically-oriented q=3 DMPC:DHPC (PC) bicelles in presence of apelin-13 (Ap13) at 16.4 T after incubation for indicated time period.
Fig. S3. Aliphatic resonance regions of 1D $^1$H spectra of indicated q=0.5 bicelles in the absence or presence of apelin-13 (Ap13) or apelin-17 (Ap17). Bicelle acyl-chain and headgroup CH$_3$ moieties used for DOSY-based D$_C$ determination are indicated.
Supplementary material for Sarker, Speckert & Rainey “Bicelle composition-dependent 
modulation of phospholipid dynamics by apelin peptides.”

**Fig. S4.** $^1$H DOSY spectra of pure bicelles and signal attenuation fits for $D_C$ calculation.
Fig. S5. $^{31}$P DOSY spectra of pure bicelles and signal attenuation fits for $D_C$ calculation. Greater data scatter is apparent for the much less intense PG headgroup.
Fig. S6. $^1$H DOSY spectra of apelins in aqueous condition and signal attenuation fits for $D_c$ calculation. As expected, the larger Ap17 exhibits slower diffusion than Ap13, indicated by higher positioning of its DOSY signals (red bars).
Fig. S7. $^1$H diffusion coefficient ($D_C$) values for DSS as obtained by DOSY NMR in the presence of apelin-13 (Ap13) or apelin-17 (Ap17) in 90% H$_2$O/10% D$_2$O and/or in the presence of q=0.5 DMPC:DHPC (PC) or DMPC:DMPG:DHPC (PC-PG) bicelles determined at 37 °C.