SUPPORTING INFORMATION

Amphiphilicity is a key determinant in the membrane interactions of synthetic 14-mer cationic peptide analogs

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1) Solid-state NMR (REDOR)

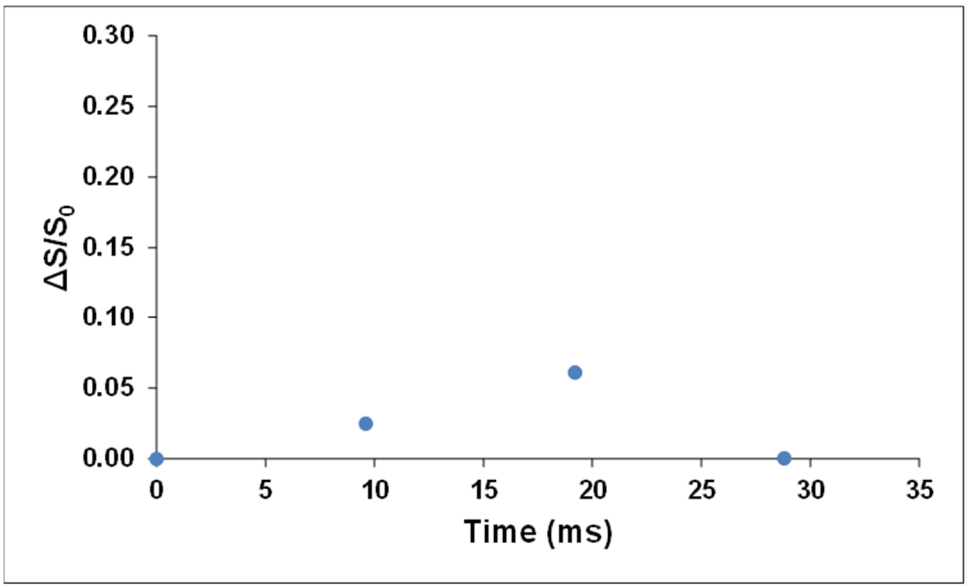

Figure S1. $^{15}N\{^{31}P\}$ REDOR dephasing curve for ^{15}N-Leu_3-R4R11 peptide reconstituted into lyophilized DMPC multilamellar vesicles at a phospholipid/peptide molar ratio of 20/1. The spinning speed was kept constant at 5000 Hz and experiment was carried out at -10 °C.

2) ATR spectroscopy

The investigation of the membrane topology of R5R10 and R4R11 peptides in lipid multilayers was done by studying the linear dichroism of the amide I' band. Examples of amide I' spectral region for spectra acquired with horizontal and vertical polarized lights are illustrated in Figures S2 and S3 for R5R10 and R4R11 peptides, respectively.

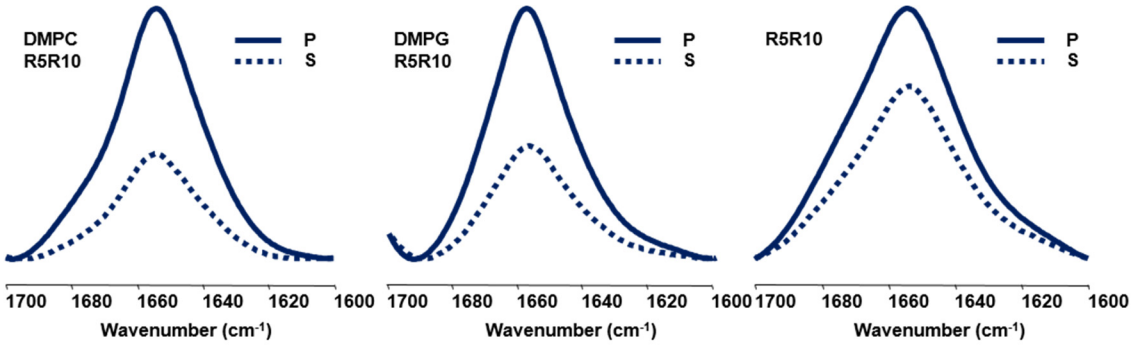

Fig S2. Amide I' spectral region of ATR spectra acquired with parallel (P) and perpendicular (S) polarized lights for the R5R10 peptide interacting with DMPC multilayers, DMPG multilayers, and in the absence of phospholipids. The phospholipid/peptide molar ratio was 60/1.

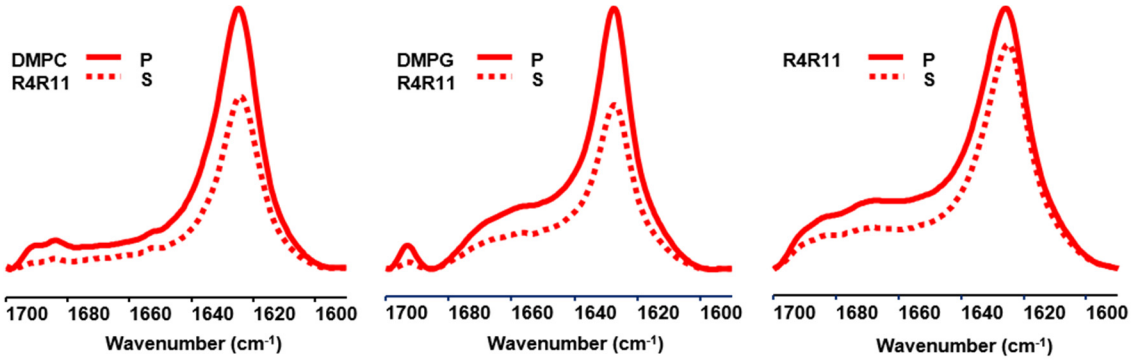

Fig S3. Amide I' spectral region of ATR spectra acquired with parallel (P) and perpendicular (S) polarized lights for the R4R11 peptide interacting with DMPC multilayers, DMPG multilayers, and in the absence of phospholipids. The phospholipid/peptide molar ratio was 60/1.

3) Fluorescence spectroscopy

Calcein leakage

The leakage activity of R5R10 and R4R11 peptides was monitored by the dequenching of the calcein fluorophore and kinetic measurements are displayed in Figures S4 and S5.

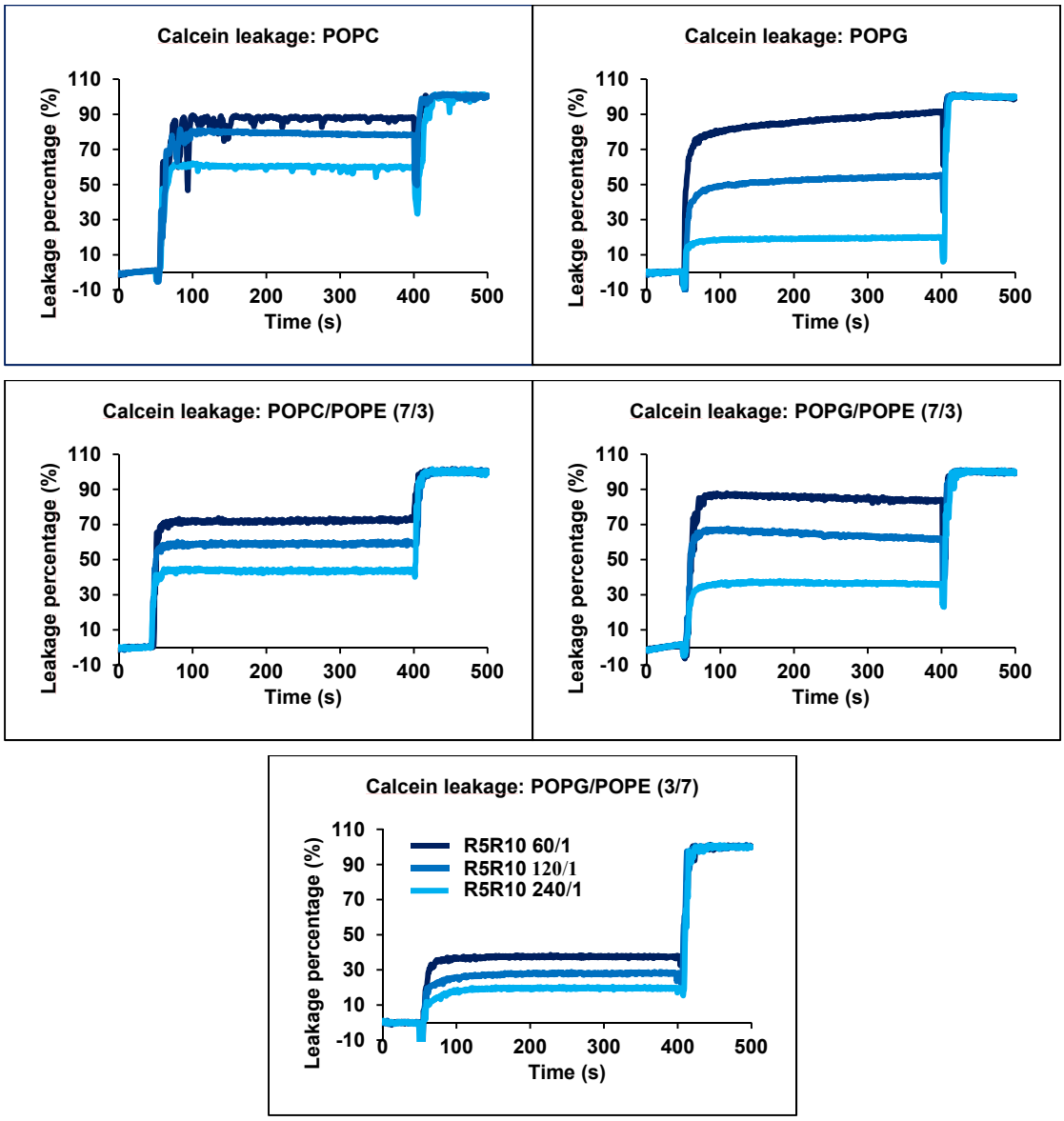

Fig S4. Kinetic measurements of calcein leakage induced by the presence of the R5R10 peptide in POPC, POPG, POPC/POPE (7/3), POPG/POPE (7/3), and POPG/POPE (3/7) SUVs. Triton X-100 has been added after 400 s to induce the complete disruption of the membranes. All measurements were done at 37 °C.

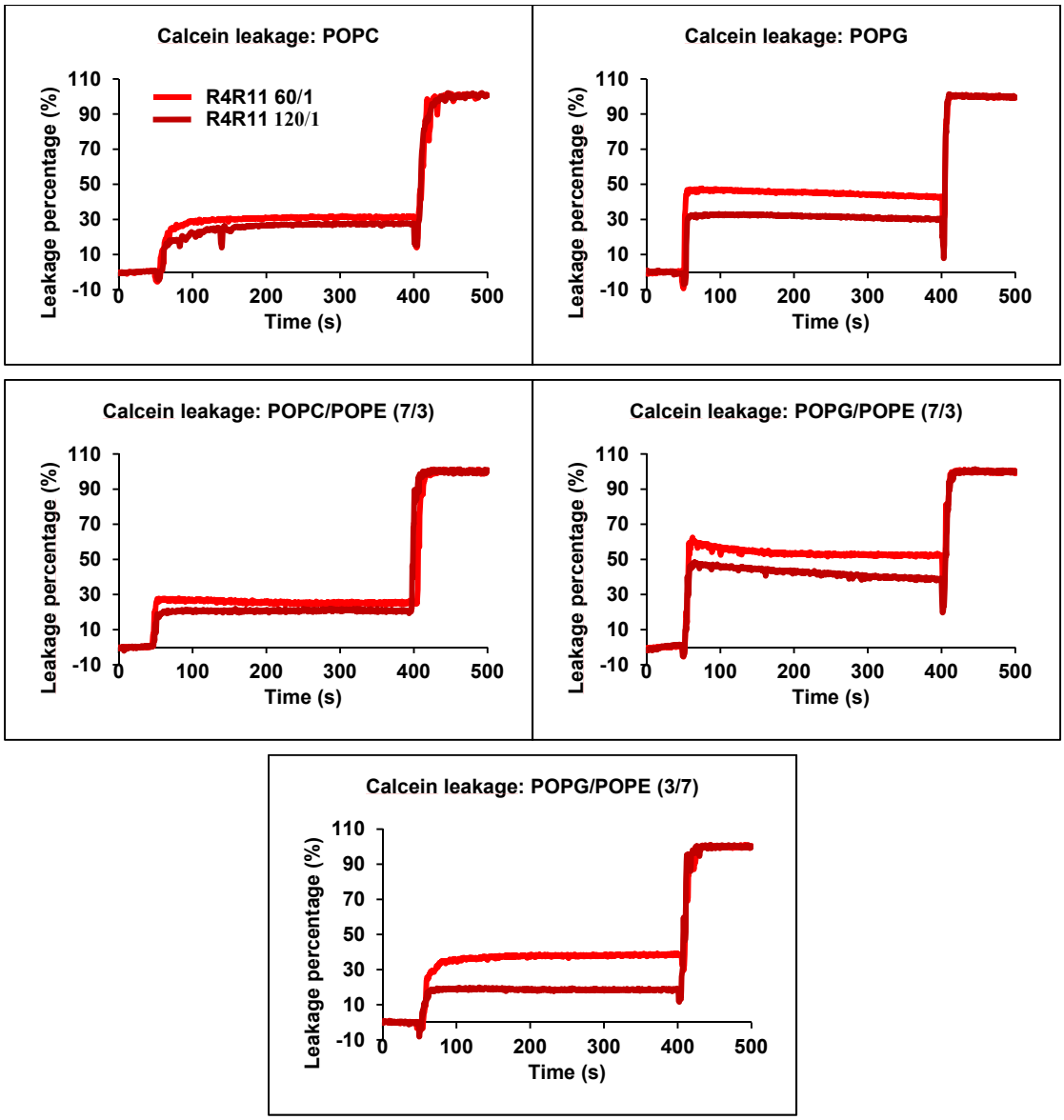

Fig S5. Kinetic measurements of calcein leakage induced by the R4R11 peptide in POPC, POPG, POPC/POPE (7/3), POPG/POPE (7/3), and POPG/POPE (3/7) SUVs. Triton X-100 has been added after 400 s to induce the complete disruption of the membranes. All measurements were done at 37 °C.

Dextran leakage

In order to estimate the size of the pores induced by the β-sheet forming peptide R4R11, dequenching of the 3 kDa FITC-dextran entrapped in POPC/POPG 1/1 liposomes was monitored and the kinetic measurement is displayed in Figure S6. The signal to noise ratio is lower since encapsulation of dextrans in liposomes is more complex to achieve.

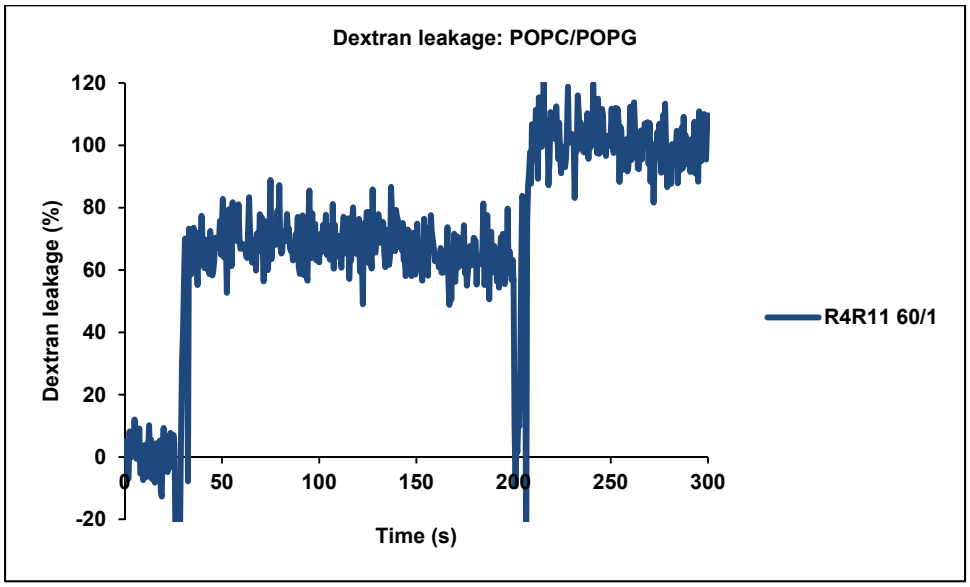

Fig S6. Kinetic measurements of the 3 kDa FITC-dextran leakage induced by the R4R11 peptide in POPC/POPG 1/1 SUVs. Triton X-100 has been added after 200 s to induce the complete disruption of the membranes. The measurement was done at 37 °C.