



**Figure S1:**  $^{31}\text{P}$  NMR spectra of **(A)** 2.65 mM lipid II in 360mM of DPC- $\text{d}_{38}$  in the presence of 22.5mM NAI-107. **(B)** 2.65 mM lipid II in 360mM of DPC- $\text{d}_{38}$ . **(C)** 360mM of DPC- $\text{d}_{38}$ . All solutions in 25mM imidazole- $\text{d}_4$ , 1mM  $\text{NaN}_3$  and 17.2mM of TSP- $\text{d}_4$  (sodium trimethylsilylpropionate) in 90%  $\text{H}_2\text{O}/10\%$   $\text{D}_2\text{O}$ , pH 6.50. All spectra are scaled to the DPC peak at  $-3.4$  ppm, different noise levels reflect different numbers of scans recorded. Spectra were processed with 2 Hz exponential line broadening.