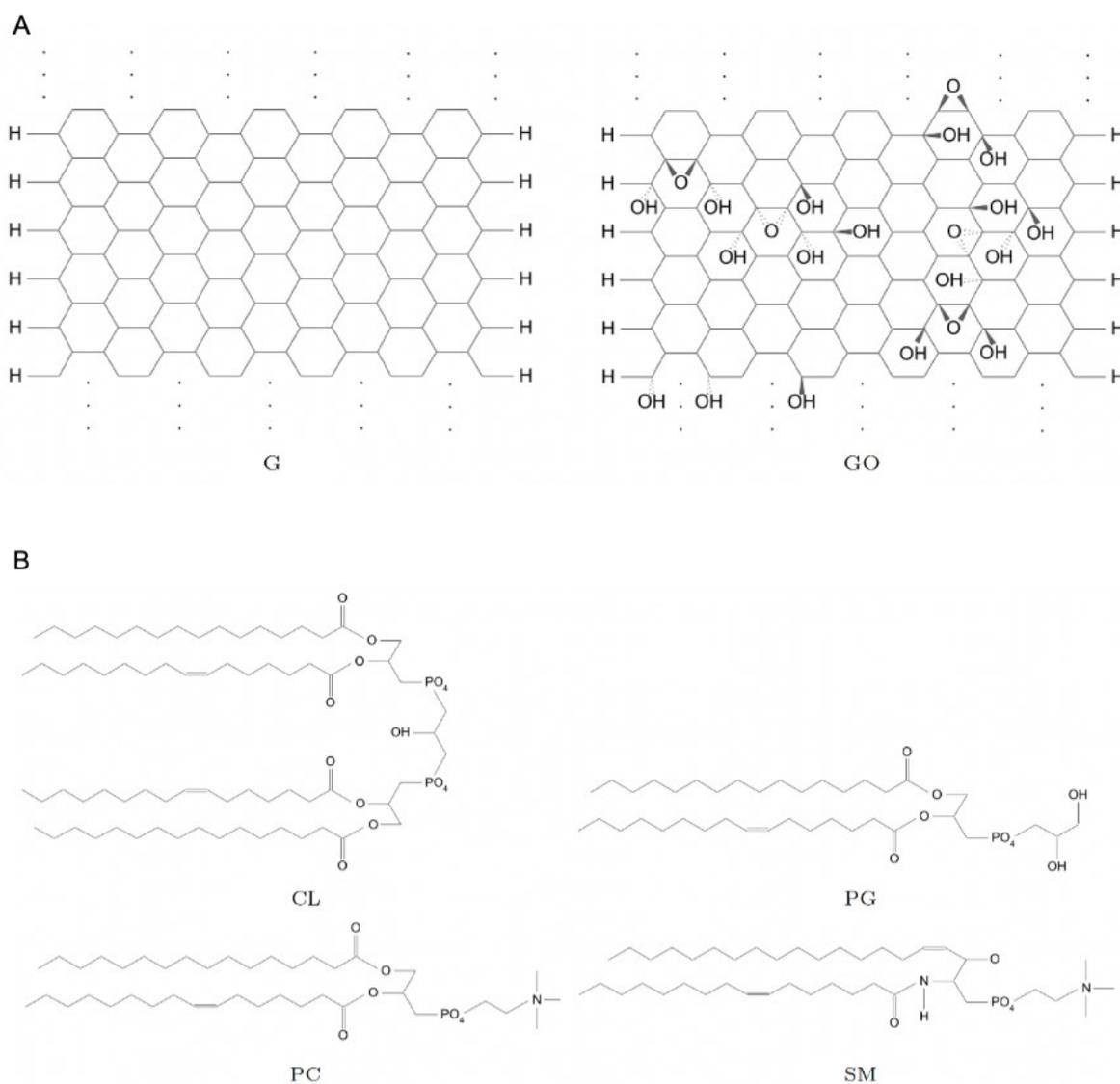
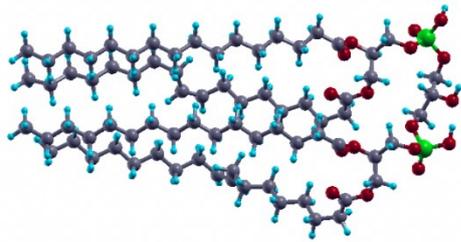


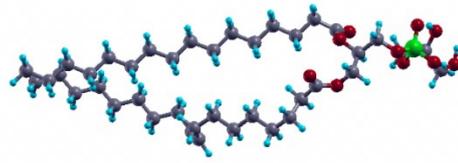
Supplementary figures:



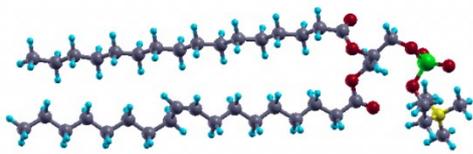
Supplemental Fig. 1. The initial 2D structures used in this study. A) The initial 2D structure of G (Graphene) and GO (Graphene oxide) flakes. The dots at the top and bottom of G and GO represent the periodicity in the z direction. The x direction is across the sheet while the y direction is into the paper. B) 2D structure of phospholipids as retrieved from PubChem. The abbreviations as in Figure 1 of the main text.



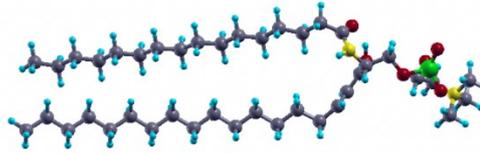
(a) CL



(b) PG

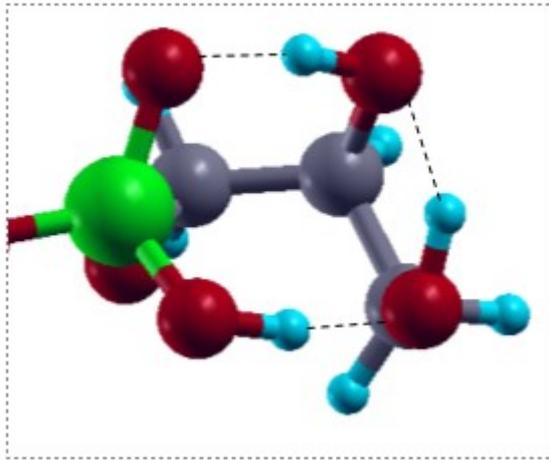


(c) PC

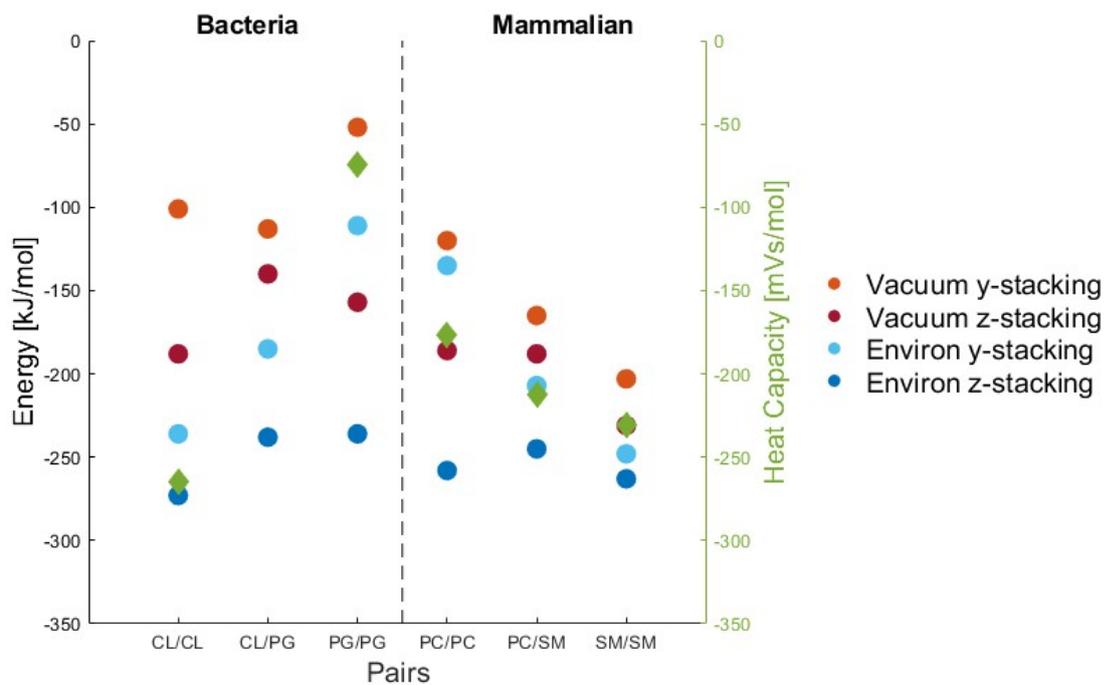


(d) SM

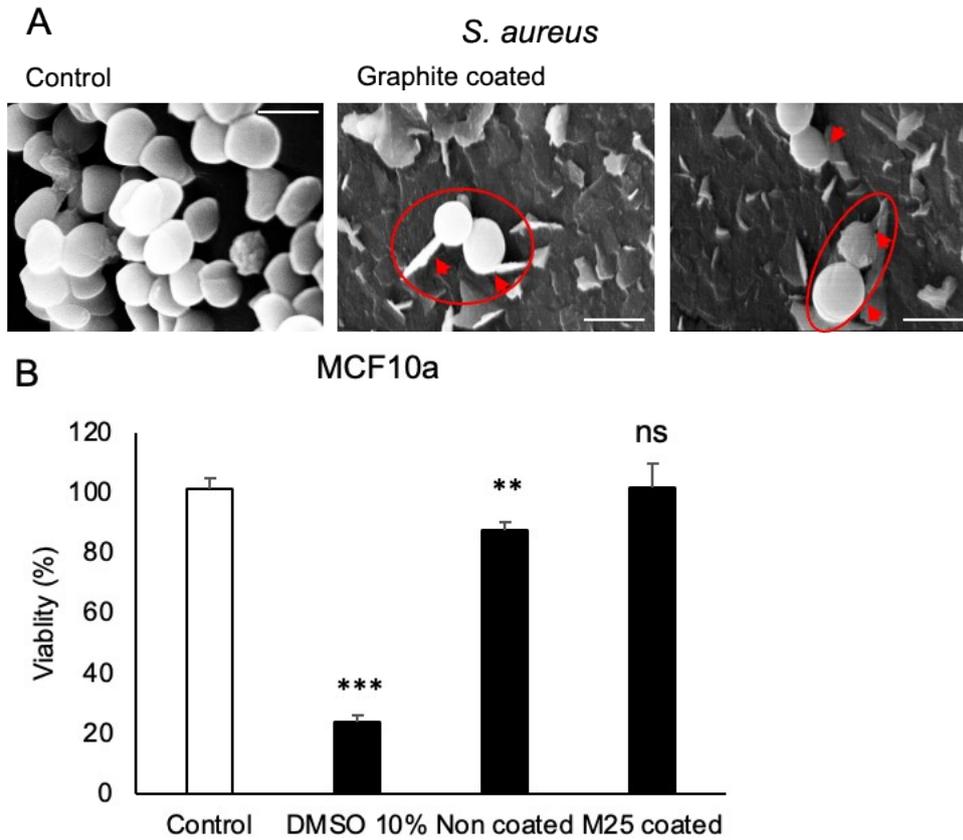
Supplemental Fig. 2. The molecular structure of isolated phospholipids used in this study. The abbreviations and color coding as in Figure 1 of the main text.



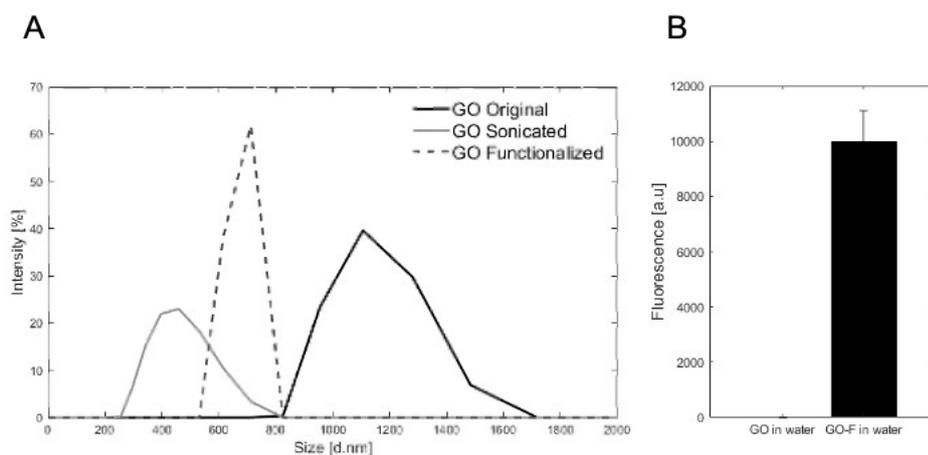
Supplemental Fig. 3. OH arrangement in the head of phosphatidylglycerol. Color coding as in Figure 1 of the main text.



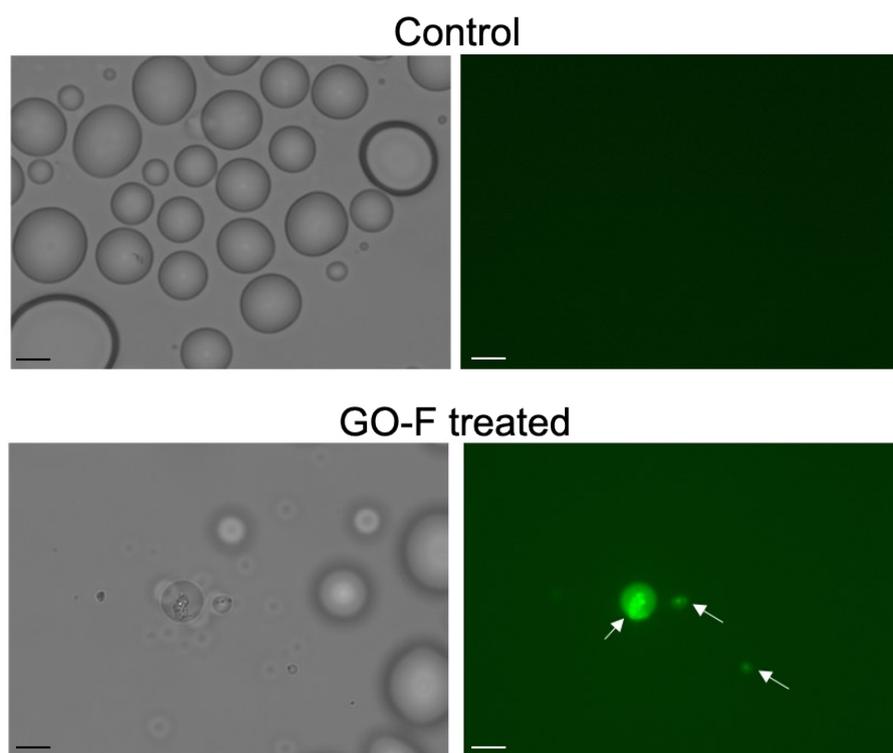
Supplemental Fig. 4. Plot of the interaction energy between paired phospholipids. Orange and red dots represent vacuum, while light- and dark blue shows calculations with water environment. The abbreviations as in Figure 1 of the main text.



Supplemental Fig. 5. A) SEM images of *S. aureus* interaction with vertically orientated graphene on polymer coated with 10 mg/mL graphene solution compared to the control non-coated polymer. The scale bar is 1 μ m. B) AlamarBlue assay of MCF10a cells in the presence of coated polymers with 10 mg/mL GNP for 24 h. All values were normalized to those obtained from untreated cells (medium only). 10% DMSO was used as positive control. Data represent the mean \pm SE of three independent replicates and it was statistically analyzed and compared with the control (** $p \leq 0.01$, *** $p \leq 0.001$, ns: not statistically significant) using Student's t test.



Supplemental Fig. 6. Successful functionalization of graphene oxide (GO) with fluorescein. A) Size distribution from dynamic light scattering of functionalized GO with fluorescein (GO-F) and GO. B) Measured fluorescence from pure GO and GO-F in water.



Supplemental Fig. 7. PC/SM (50%/50%) liposomes representing mammalian cells membrane. Images from fluorescent microscopy of liposomes after treatment with GO-F compared to non-treated liposomes. Left and right images represent the bright field and fluorescent microscopic observations. The scale bar is 10 μm .

