

Supplementary Materials:

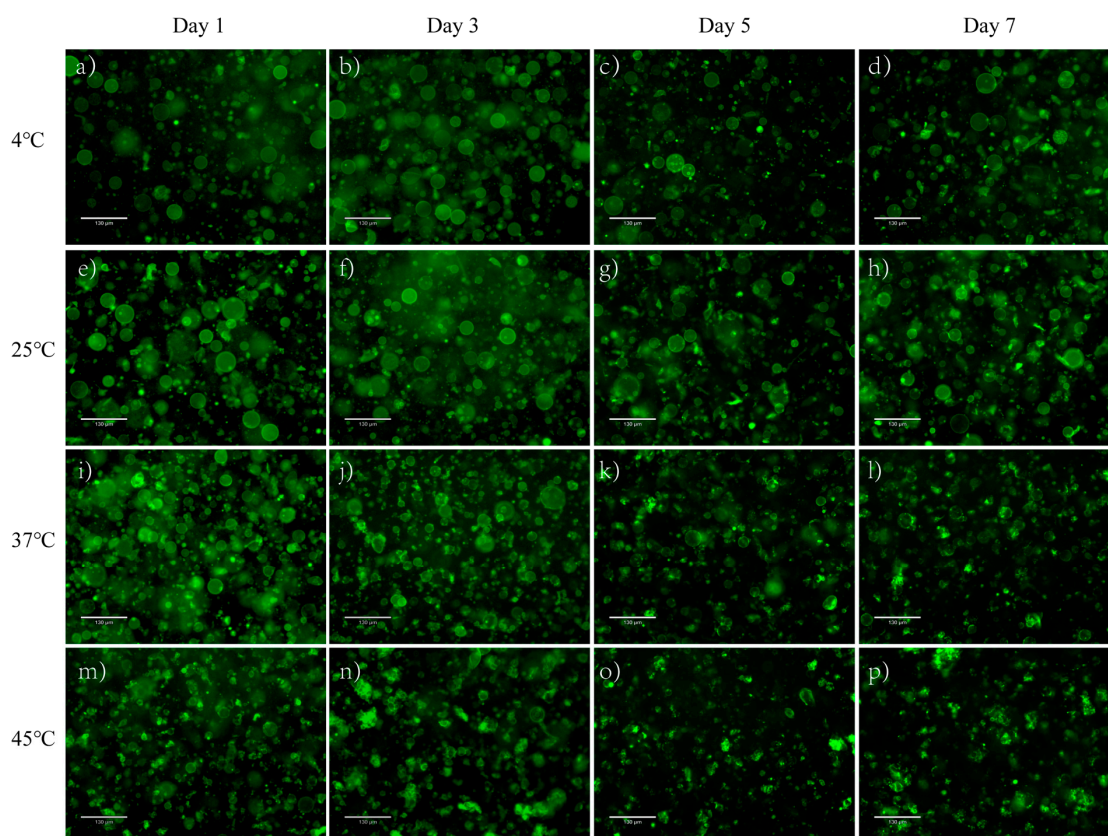


Figure S1. DiO-labeled GUVs morphology was observed under a microscope at different temperatures and times. a) 4°C Day 1; b) 4°C Day 3; c) 4°C Day 5; d) 4°C Day 7; e) 25°C Day 1; f) 25°C Day 3; g) 25°C Day 5; h) 25°C Day 7; i) 37°C Day 1; j) 37°C Day 3; k) 37°C Day 5; l) 37°C Day 7; m) 45°C Day 1; n) 45°C Day 3; o) 45°C Day 5; p) 45°C Day 7. scale bar 130 μm .

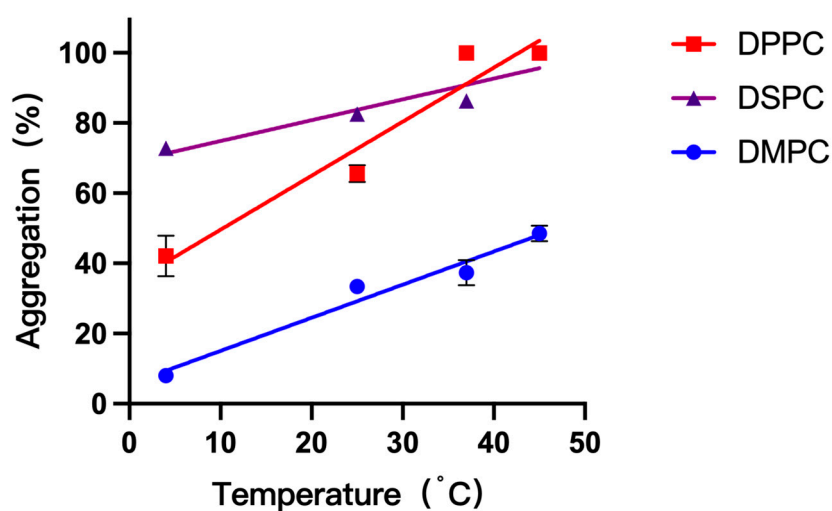


Figure S2. Degree of aggregation of GUVs prepared from DMPC, DPPC, and DSPC in water.

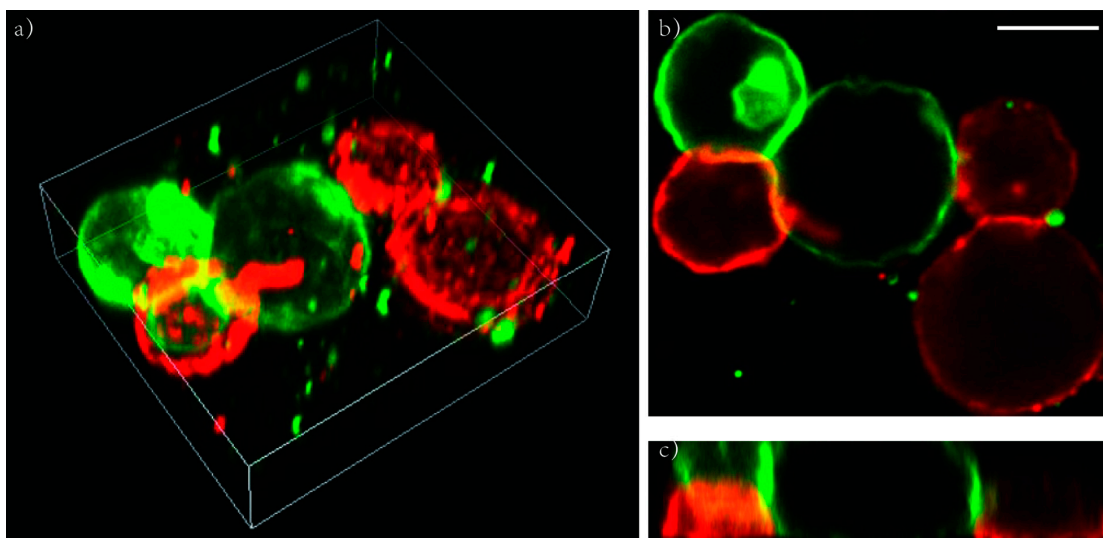


Figure S3. The aggregates were scanned with a laser confocal microscope to reconstruct the images (green GUV: labeled by DiO, red GUV: labeled by DiI) ($70 \times 0.5 \mu\text{m}$). a) 3D-image; b) XY-2D-image; c) YZ-2D-image. scale bar $20 \mu\text{m}$.

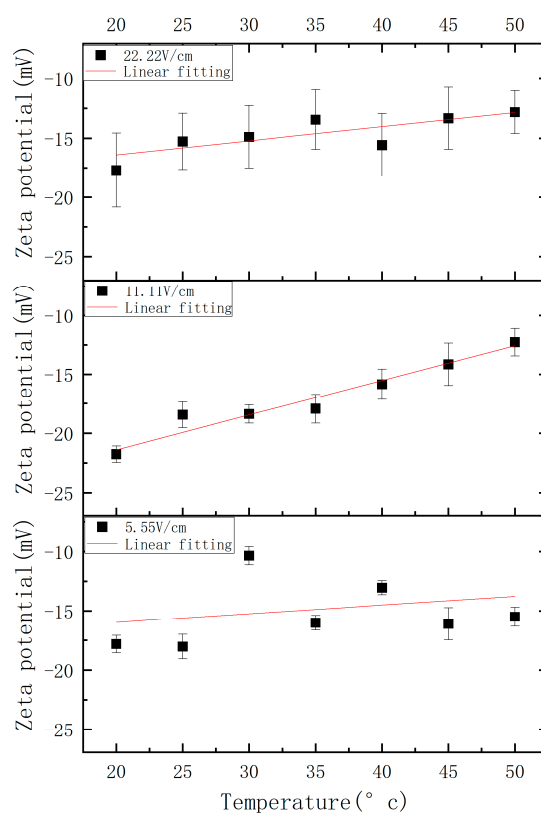


Figure S4. Zeta potential of DPPC-GUVs measured in various electric fields as a function of temperature.

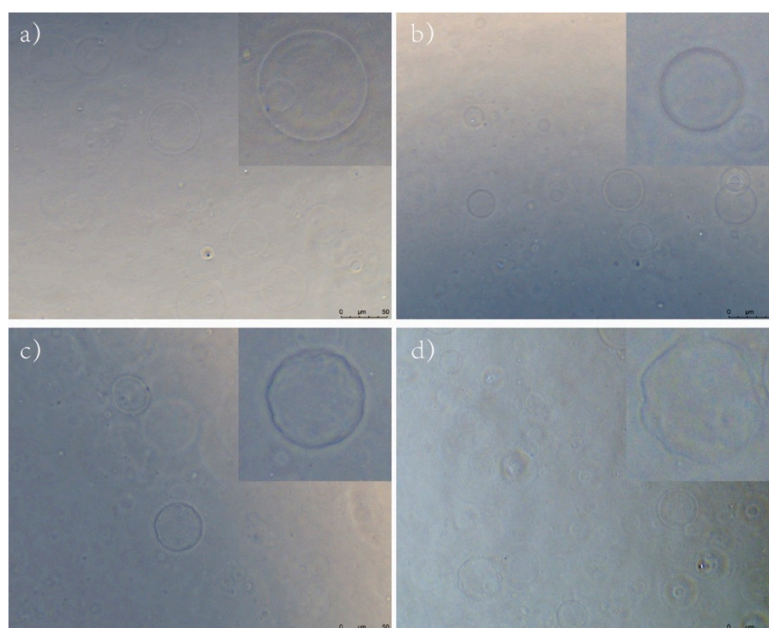


Figure S5. The morphology of DPPC-GUVs was observed under a microscope after different electric fields. a) 0 V/cm, b) 5.55 V/cm, c) 11.11 V/cm, d) 22.22 V/cm. scale bar 50 μm .

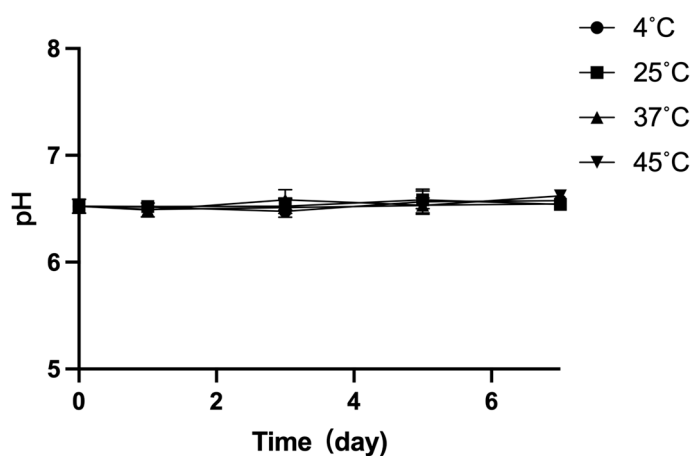


Figure S6. pH changes in GUVs solution.

Temperature	Free fatty acid concentration ($\mu\text{mol/mL}$)
4°C (Day 7)	0
25°C (Day 7)	0
37°C (Day 7)	0
45°C (Day 7)	0

Table S1 Free fatty acid content of GUVs suspensions after 7 days of incubated at different temperatures.