Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supported Lipid Bilayer Repair Mediated by AH Peptide

Supporting Information

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SI Figure Legend

Figure S1. Various characterization efforts on the formation of a complete supported lipid bilayer. (A-B) QCM-D monitoring of SLB formation on a silicon oxide substrate using 30nm filtered POPC vesicle fusion method. Changes in resonance frequency and energy dissipation were recorded at ~26 Hz and ~0, respectively. **(C)** Fluorescence recovery after photobleaching was conducted on the rhodamine-labeled (0.5 mol %) lipid bilayer. Time-lapse images before and after the photo bleaching were taken in 30 sec interval. **(D)** Atomic force microscopy (AFM) image of supported lipid bilayer. AFM height image was taken on SLB formed on QCM-D silicon oxide substrate. **(E)** AFM height image after conducting a square test on the SLB. The test was conducted to measure the thickness of SLB by scratching the bilayer SLB with an AFM cantilever tip which the imaging protocol described in Wallin et al[1].

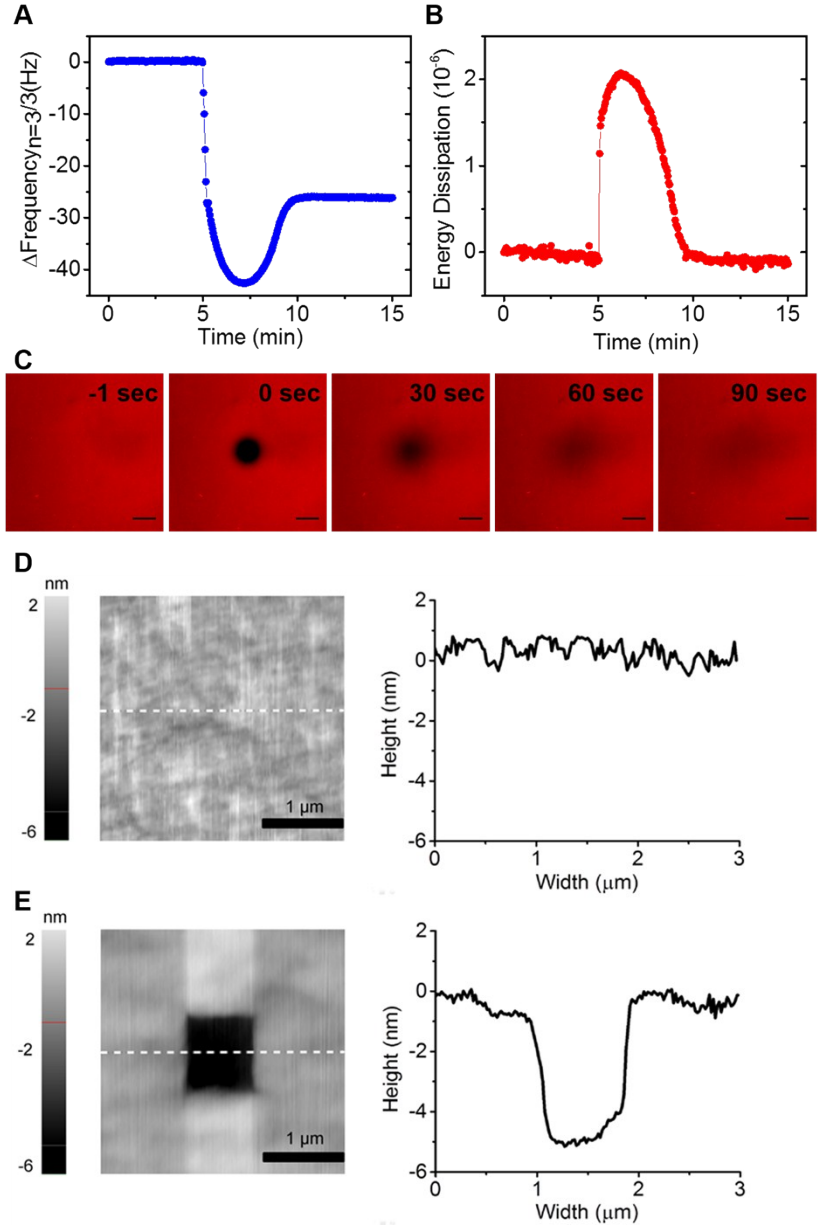


Figure S2. Intensity-weighted size distribution of extruded vesicles as a function of extrusion pore diameter. Dynamic light scattering measurements were conducted on the extruded POPC vesicles. **(A-G)** Intensity-weighted Gaussian distributions and histogram are shown as functions of the extrusion pore diameter (50 to 400 nm diameter). While the histogram distribution reflects the relative amount of light that scattered by vesicles in different size ranges, the Gaussian distribution assumes that the vesicle size distribution is centered on a mean particle size. The numbers with asterisk indicate how many times vesicle solutions were passed through the extrusion pore membranes.

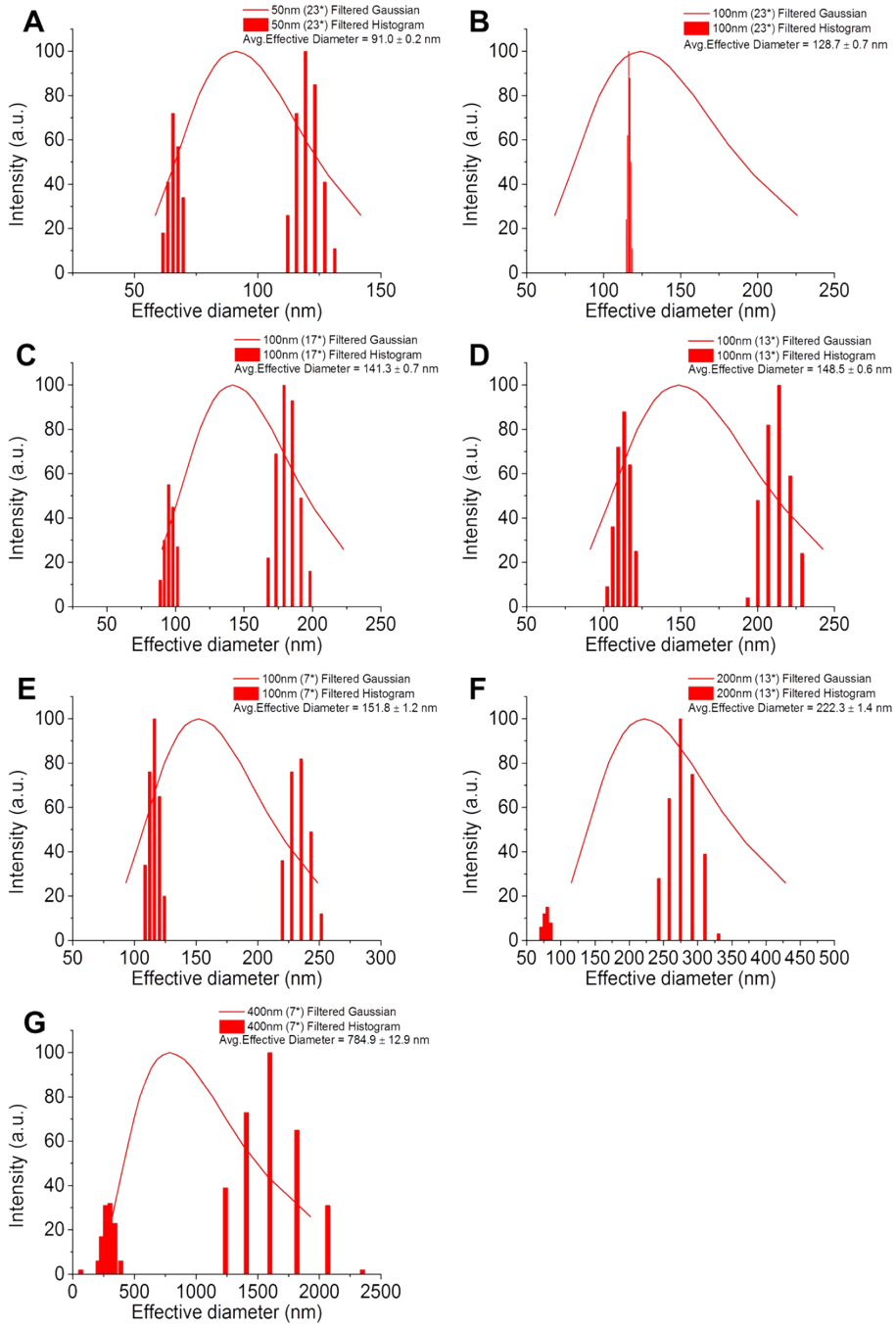
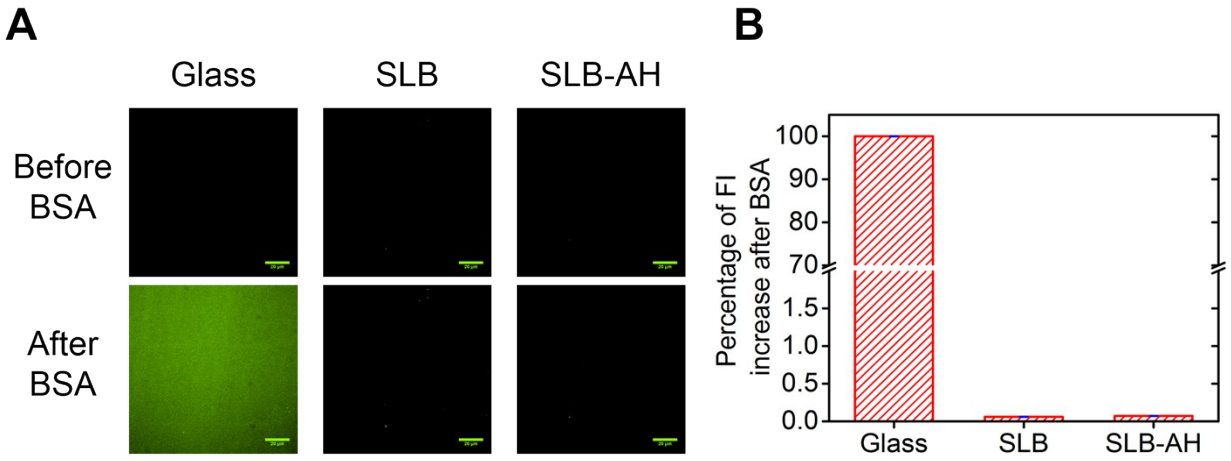


Figure S3. BSA protein attachment before and after SLB repair by AH peptide. Fluorescein-labeled BSA (0.05 mg/ml) was injected and incubated for ~15 min. Then, it was followed by Tris buffer washing to remove any unbound BSA. **(A)** The labeled BSA was added directly onto glass substrate as a control measurement, and it was also injected onto the SLB before and after AH peptide-mediated repair. Each set of images was normalized by subtracting from the background fluorescence intensity values. **(B)** Percentage of normalized fluorescence intensity increments after BSA addition was quantified. The normalized fluorescence intensity of the control measurement was set as the reference and applied to the SLB and AH peptide-treated SLB (SLB-AH). From each image set, the average fluorescence intensities and standard deviations were collected from a total of nine different areas from within the field of view.



Supplementary Movie 1. A time-lapse sequence of fluorescence images of AH peptide mediated repair process on SLB formed by ca. 91.1 nm vesicles.

Supplementary Movie 2. A time-lapse sequence of fluorescence images of AH peptide mediated repair process on SLB formed by ca. 141.6 nm vesicles

Supplementary Movie 3. A time-lapse sequence of fluorescence images of AH peptide mediated repair process on SLB formed by ca. 187.79 nm vesicles

Supporting References

1. Wallin, M.; Choi, J.-H.; Kim, S. O.; Cho, N.-J.; Andersson, M. Peptide-induced formation of a tethered lipid bilayer membrane on mesoporous silica. *European Biophysics Journal* **2015,** *44* (1-2), 27-36.