

## Supporting Information

### **Antibody-free Determinations of Low-Mass, Soluble Oligomers of A $\beta$ <sub>42</sub> and A $\beta$ <sub>40</sub> by Planar Bilayer Lipid Membrane-based Electrochemical Biosensor**

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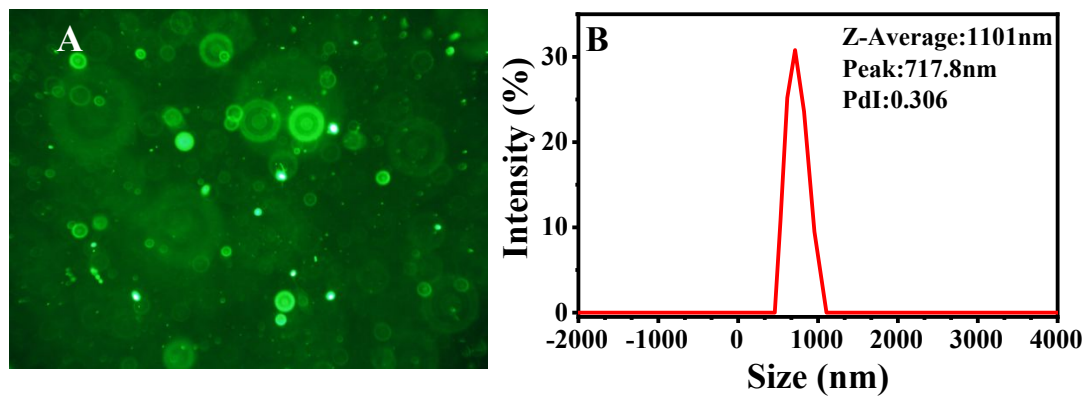
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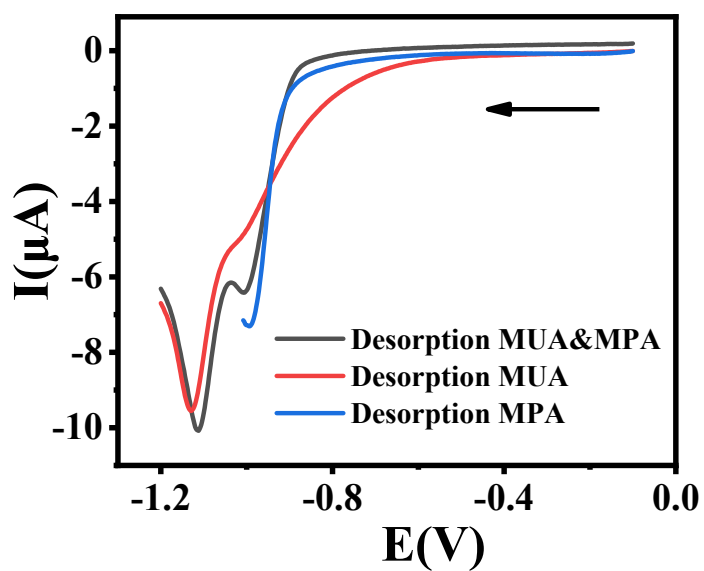
Supplemental Figures

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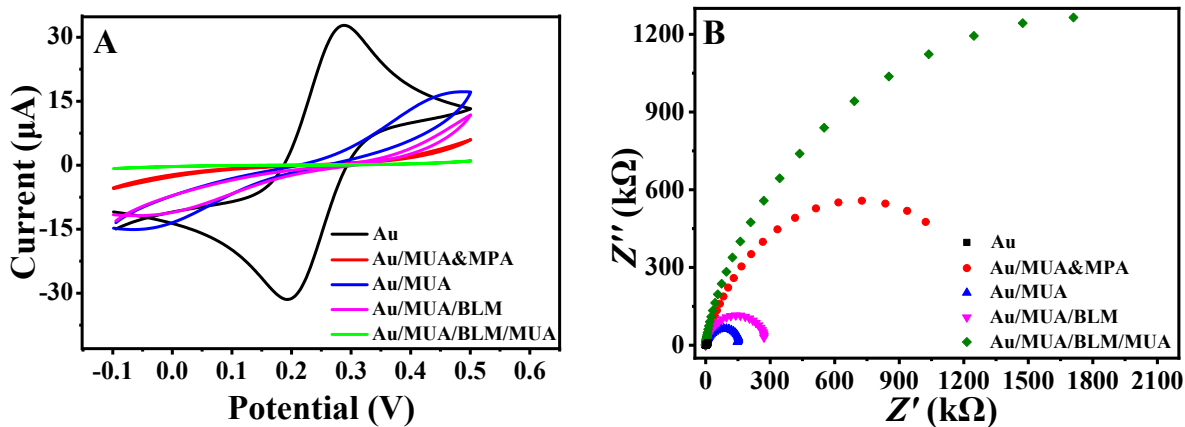
## Supplemental Figures



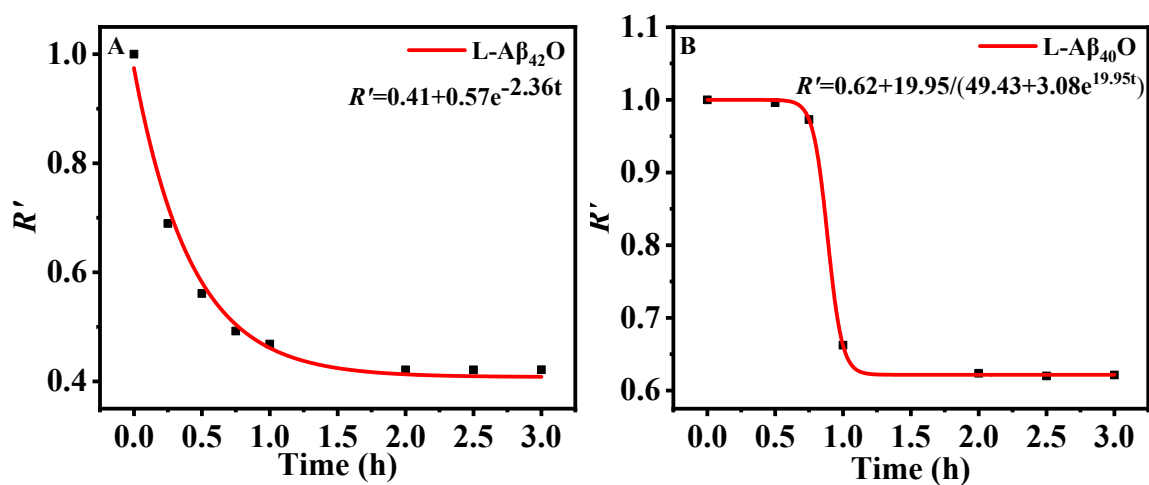
**Figure S-1.** Characterization of DOPC vesicles by fluorescent image of DiO (A) and dynamic light scattering (B).



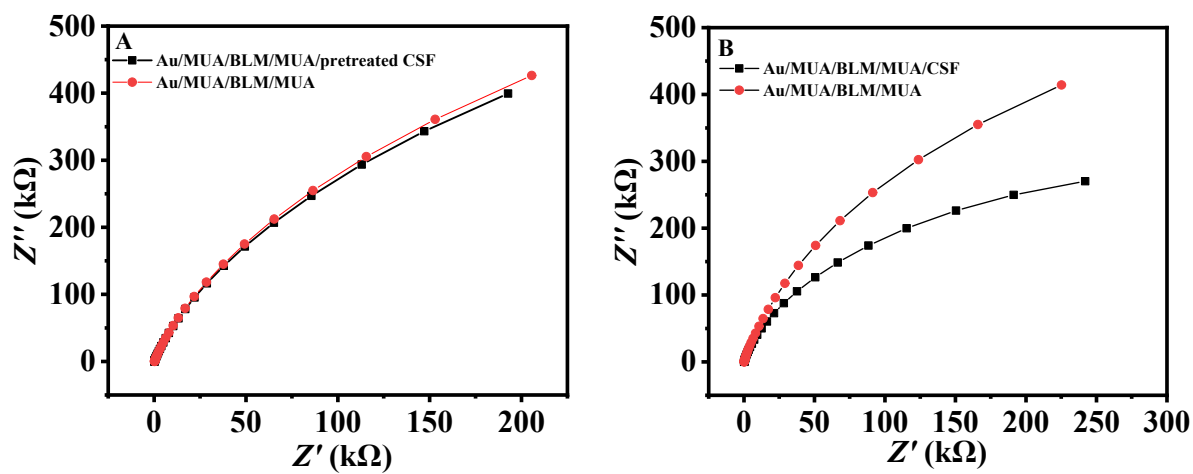
**Figure S-2.** Linear sweep voltammograms of MPA, MUA or mixed MPA/MUA SAM in a 0.5 M NaOH solution. Arrows indicate the scan direction. The scan rate was  $0.05 \text{ V} \cdot \text{s}^{-1}$ .



**Figure S-3.** Characterization of the successive fabrication of the BLM-based electrochemical sensor by CV (A) and EIS in Nyquist plot (B) in 5 mM  $[\text{Fe}(\text{CN})_6]^{3-/4-}$  redox pair (1:1 molar ratio) solution with 0.1 M NaCl. The scanning rate of CV was  $50 \text{ mV} \cdot \text{s}^{-1}$ . The frequency range in the EIS measurements was from 0.1 MHz to 0.1 Hz using an AC potential of 10 mV, superimposed on a DC potential of 0.225 V.



**Figure S-4.** Kinetic fitting results of L-A $\beta_{42}$ O (A) and L-A $\beta_{40}$ O-induced membrane damages (B).



**Figure S-5.** EIS in Nyquist plots of BLM-based sensor in 5 mM  $[\text{Fe}(\text{CN})_6]^{3-/4-}$  solution at zero bias after incubated with 50 μL CSF with (A) or without pretreatment of EDTA and ascorbic acid (B). Solid lines in each panel are fittings using EEC.