Supporting Information

Facile generation of biomimetic supported lipid bilayers on conducting polymer surfaces for membrane biosensing

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S1. Vesicle fusion on PEDOT:PSS film or bare sensor surface measured by QCM-D

For VF experiments, PEDOT:PSS films or bare sensor surfaces were first stabilized by flowing in PBS buffer with a flow rate of 50 μL/min. Then, vesicles were delivered to the SiO_2 sensor or PEDOT:PSS films and monitored for rupture. Finally, the excess vesicles were rinsed out of the chamber and the final equilibrated values report the associated frequency and dissipation changes that reflect whether or not a bilayer formed. The only case here that reflects the characteristic behavior and values indicative of bilayer formation from vesicle rupture is the mammalian model on the bare SiO_2 sensor surface. These resultant values (means ± s.d., n =3) are in **Table 3** in the main text.

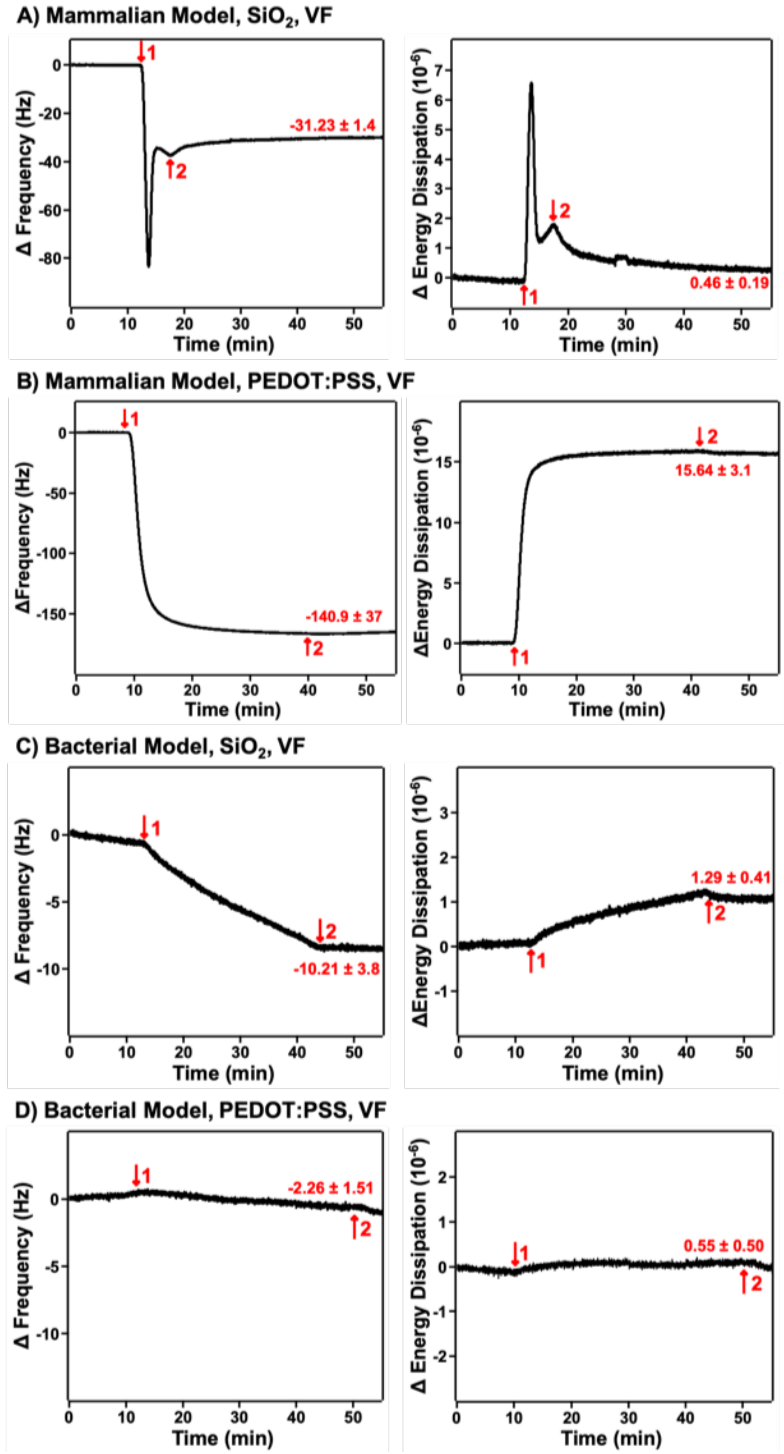

Figure S1. QCM-D monitoring VF on glass and PEDOT:PSS surfaces. (A) Mammalian model membrane on the sensor (SiO_2). (B) Mammalian model membrane on the PEDOT:PSS coated sensor. (C) Bacterial model membrane on the sensor (SiO_2). (D) Bacterial model membrane on the PEDOT:PSS coated sensor. The measurements of frequency (Δf) and energy dissipation (ΔD) were showed under the third overtone. The error bars were calculated by the means of the results for three experiments. The arrows indicate time of delivery: of (1) the lipid mixture to the sensor and (2) PBS rinsed excessive liposomes in the chamber.

S2. EIS modelling of the mammalian and the bacterial membranes

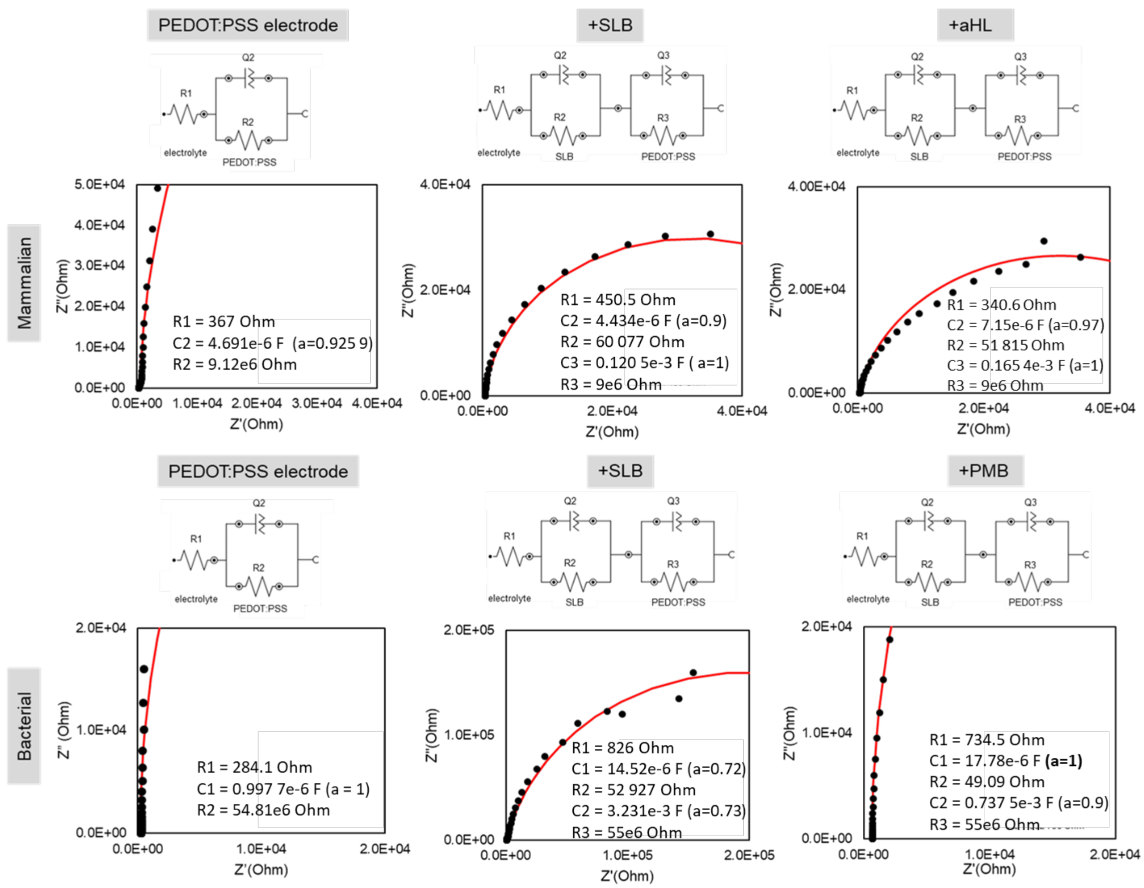

Figure S2. EIS modelling of the mammalian (top panel) and the bacterial (bottom panel) membranes on top of circular PEDOT:PSS electrodes of $0.0078 cm^2$. Red lines represent the fitted data and the black symbols the measured data.

S3. The solvent exchange control measured by QCM-D

The QCM-D was used to prove the final shift of the frequency and energy dissipation were caused by the SALB formation rather than the shift of the solvent exchange in the chamber. The baseline was stabilized by delivering the Tris/NaCl buffer at a flow rate of 50 μL/min. Next, isopropanol/water solvent was delivered to the QCM crystal, and then the solvent exchange by the Tris/NaCl in the chamber. As shown in the figure below, solvent was continuously delivered to the sensor for 45 minutes. After solvent exchange by Tris/NaCl in the chamber, the frequency and energy dissipation shift back to the baseline, indicating the final result of the Δf and ΔD can only be caused by the SALB formation rather than the solvent exchange.

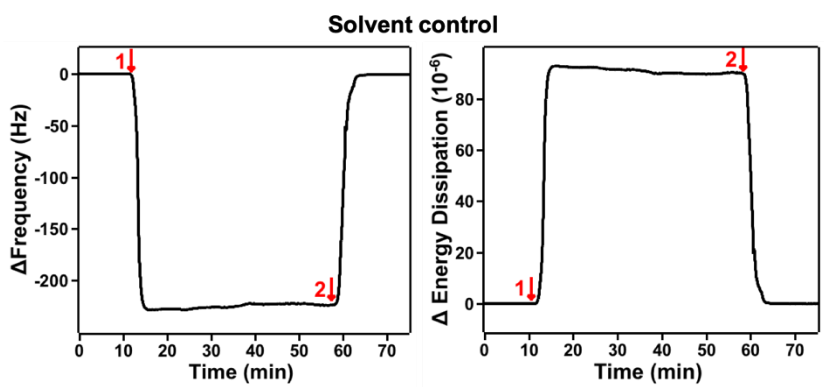

Figure S3.QCM-D monitoring the solvent-exchange process on the QCM crystal. The measurements of frequency (Δf) and energy dissipation (ΔD) were shown under the third overtone. The initial baseline was obtained in the Tris/NaCl. The arrows indicate time of delivery of: (1) the water and isopropanol solvent to the sensor, (2) solvent exchange with the identical Tris/NaCl buffer to the chamber.

S4. The insets of the final solvent exchange of QCM-D monitoring the SALB on glass and PEDOT:PSS surfaces

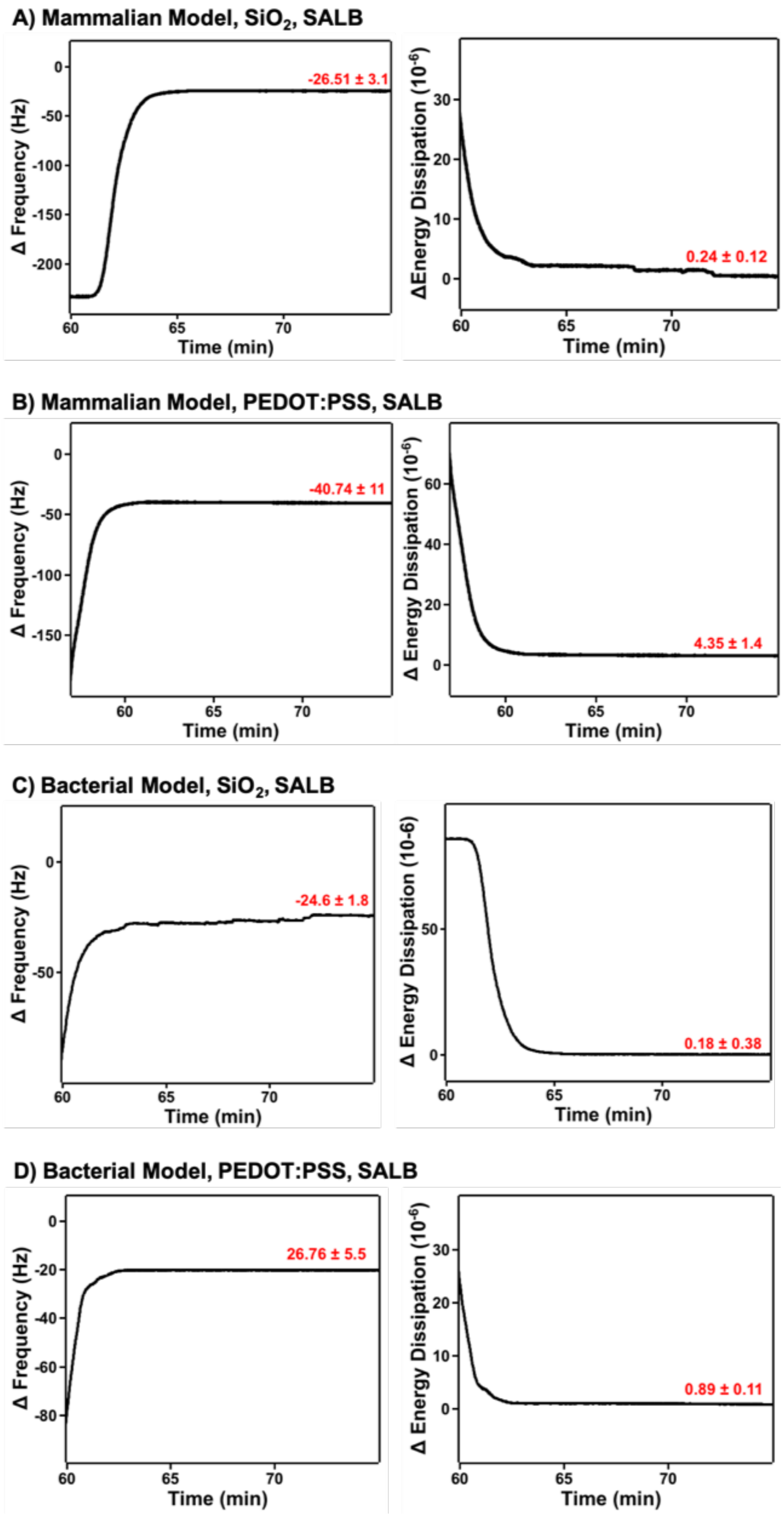

Figure S4. The insets of the final solvent exchange of QCM-D monitoring the SALB on glass and PEDOT:PSS surfaces. (A) Mammalian model membrane on the sensor (SiO_2). (B) Mammalian model membrane on the PEDOT:PSS coated sensor. (C) Bacterial model membrane on the sensor (SiO_2). (D) Bacterial model membrane on the PEDOT:PSS coated sensor. The measurements of frequency (Δf) and energy dissipation (ΔD) were shown under the third overtone. The error bars were calculated by the means of the results for three experiments