

Section 1 – EIS data

Below we show additional replicates of the experiments we discussed in the publication.

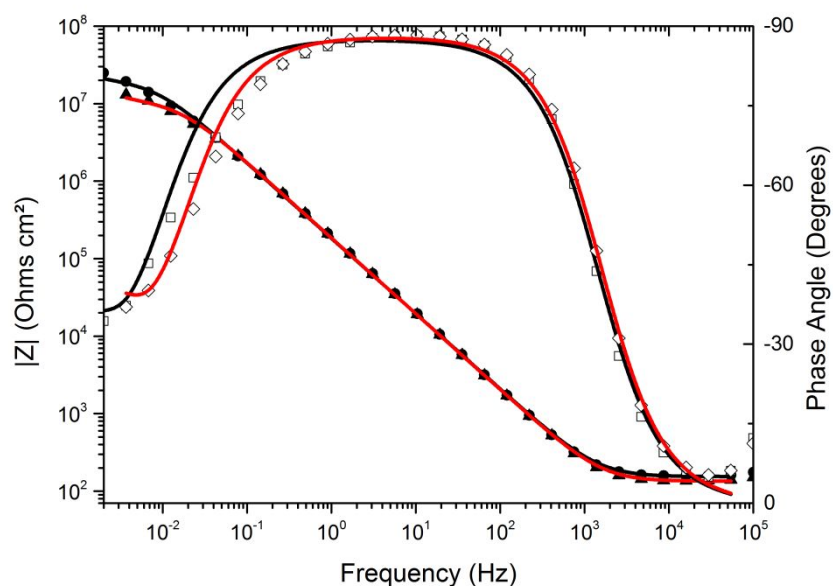


Figure S 1: (A) Bode plot showing an LPS-tBLM prior to (bilayer) (black) and after the exposure of 200 μL cationic AuNPs for 18 h (red). The lines represent the result of a fit using the model shown in (B).

Table S 1: The changes in electrical properties of two different LPS-tBLMs from the addition of gold nanoparticles exposed for 18-20 h.

	Resistance ($\text{M}\Omega\text{cm}^2$)	Capacitance (μFcm^{-2})
Experiment 1		
Bilayer before addition	18.3 ± 0.69	0.91 ± 0.01
Bilayer after exposure to 100 μL AuNP	15.2 ± 1.37	1.42 ± 0.05
After rinse	11.5 ± 1.38	1.62 ± 0.07
Experiment 2		
Before NP addition	18.2 ± 0.96	1.00 ± 0.02
Bilayer after exposure to 200 μL AuNP	8.17 ± 0.49	0.92 ± 0.30
After rinse	9.77 ± 0.35	1.00 ± 0.02

Table S 2: EIS data of the simultaneous addition of gold nanoparticles with 10 mg/mL Colistin with various rinse times.

	Resistance ($M\Omega\text{cm}^2$)	Capacitance (μFcm^{-2})
Bilayer before addition	12.1 ± 0.46	1.31 ± 0.02
Bilayer after addition of 100 μL AuNP + 10 mg/mL Colistin 18 h	13.8 ± 2.07	0.87 ± 0.06
After rinse	3.52 ± 0.74	0.83 ± 0.07
Bilayer before addition	28.7 ± 1.69	1.07 ± 0.04
Bilayer after addition of 200 μL AuNP + 10 mg/mL Colistin 17 h	28.1 ± 1.04	0.89 ± 0.01
After rinse	21.6 ± 0.95	0.91 ± 0.02

Table S 3: Electrochemical measurements with pre-treatment of the membrane with gold nanoparticles for various concentrations of gold nanoparticles with the addition post treatment of 10 mg/mL Colistin.

	Resistance ($M\Omega\text{cm}^2$)	Capacitance (μFcm^{-2})
Bilayer before addition	18.3 ± 0.69	0.91 ± 0.01
Bilayer after addition of 100 μL AuNP 20 h + 10 mg/mL Colistin 20 h	1.03 ± 0.49	1.26 ± 0.30
After rinse	6.23 ± 1.49	1.25 ± 0.18
Bilayer before addition	18.2 ± 0.96	1.00 ± 0.02
200 μL AuNP 18 h + 10 mg/mL Colistin 17 h	4.70 ± 0.21	1.09 ± 0.02

After rinse	1.66 ± 0.07	1.12 ± 0.02
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Section 2: Neutron data

Neutron experiments were carried out using two replicates. Below are the Scattering plots, SLD plots and the errors estimated by Monte Carlo Markov Chain (MCMC) sampling (10000 steps, 200 walkers).

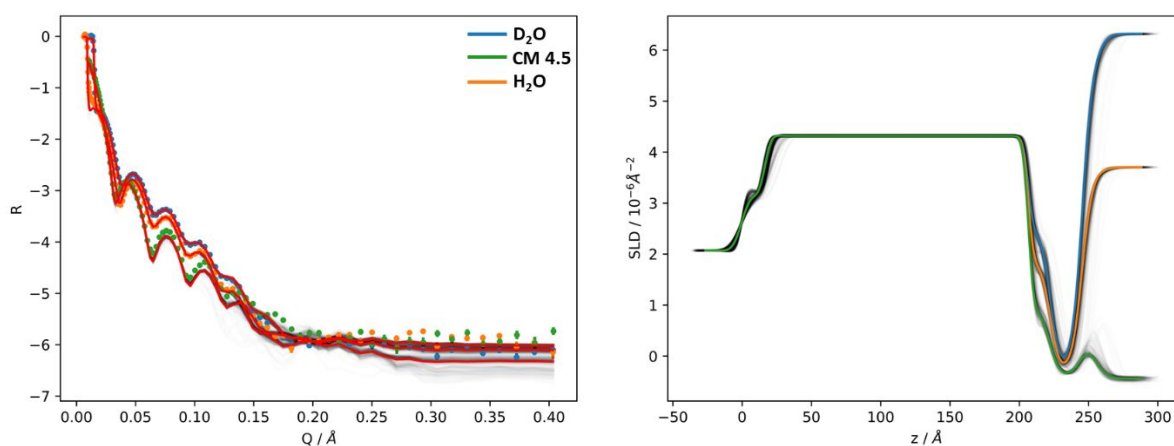


Figure S 2: Scattering plot (left) and SLD plot (right) of Initial bilayer fitted with a MCMC algorithm. The grey shadows of the lines represent the error calculated during the fitting process.

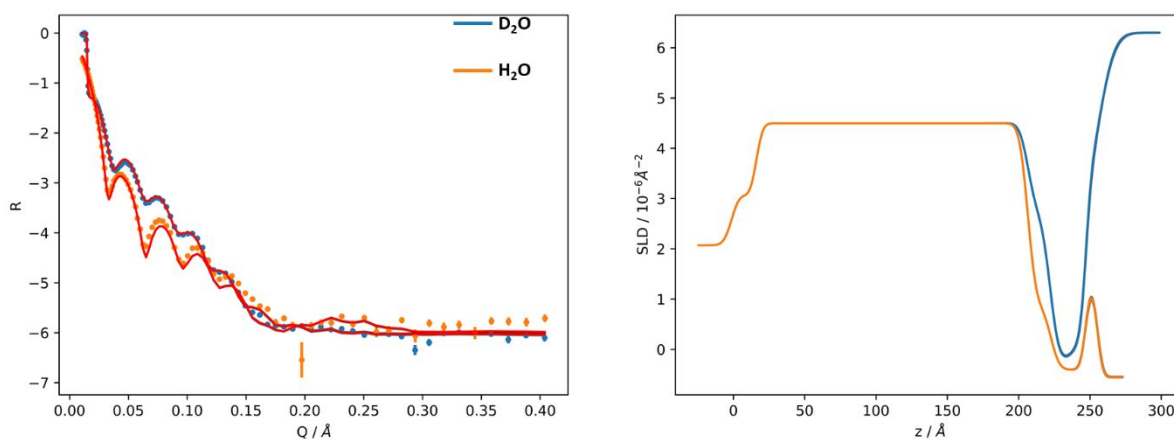


Figure S 3: Scattering plot (left) and SLD plot (right) of Initial bilayer fitted with a MCMC algorithm. The grey shadows of the lines represent the error calculated during the fitting process. Errors shown in this figure are considerably lower, as most parameters were not allowed to vary during the fitting process and thus a n error could not be estimated.

Table S 4: Neutron sample 1 parameters and errors. Thicknesses are given in Å, SLD in 10^{-6} Å^{-2} , hydration in volume-% and roughness is in Å with respect to the preceding layer. Where no error is shown, the parameter was not allowed to vary during fitting.

	Initial Bilayer		After Colistin/NP treatment	
	Parameter	Error	Parameter	error
Scale factor	0.92	0.01	0.99	0.00
Si SLD	2.07		2.07	
SiO ₂ thickness	3.09	2.15	3.09	
SiO ₂ SLD	3.47		3.47	
SiO ₂ hydration	0.0		0.0	
SiO ₂ roughness	7.93	1.50	7.93	
Cr thickness	13.43	2.32	13.43	
Cr SLD	3.03		3.03	
Cr hydration	0.0		0.0	
Cr roughness	5.33	2.30	5.33	
Au thickness	201.16	0.73	201.16	
Au SLD	4.21	0.02	4.21	
Au hydration	0.0		0.0	
Au roughness	7.91	1.19	7.91	
Tether thickness	12.00	0.07	12.00	
Tether SLD	0.53	0.16	0.53	
Tether roughness	3.01	0.53	3.01	
Tether hydration	0.25	0.05	0.25	
Inner HG thickness	5.01	0.23	5.01	
Inner HG SLD	0.81	0.04	0.81	
Inner HG roughness	3.19	1.36	3.19	
Inner HG hydration	0.10	0.02	0.10	
Inner HC thickness	12.01	0.42	12.01	
Inner HC SLD	-0.40	0.01	-0.40	
Inner HC roughness	3.43	0.54	3.43	
Inner HC hydration	0.05	0.00	0.01	0.00
Outer HC thickness	12.12	0.13	12.03	
Outer HC SLD	-0.38	0.03	-0.40	0.00
Outer HC roughness	6.94	2.05	18.77	1.98
Outer HC hydration	0.03	0.02	0.05	0.00
Outer HG thickness	7.81	0.50	9.55	0.05
Outer HG SLD	3.14	0.30	1.63	0.04
Outer HG roughness	3.09	0.07	3.02	0.04
Outer HG hydration	0.64	0.02	0.10	0.00
Solvent SLD	6.23	0.01	6.18	0.00
Background roughness	8.10	1.10	3.03	0.04

Abbreviations: HC: hydrocarbon chains, HG: head group, SLD: scattering length density

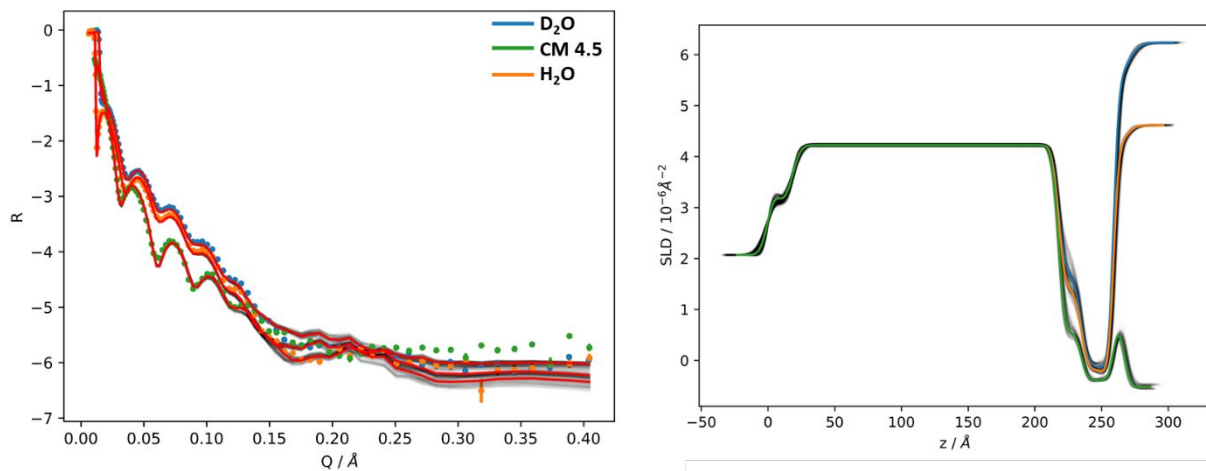


Figure S 4: Scattering plot (left) and SLD plot (right) of Initial bilayer fitted with a MCMC algorithm. The grey shadows of the lines represent the error calculated during the fitting process.

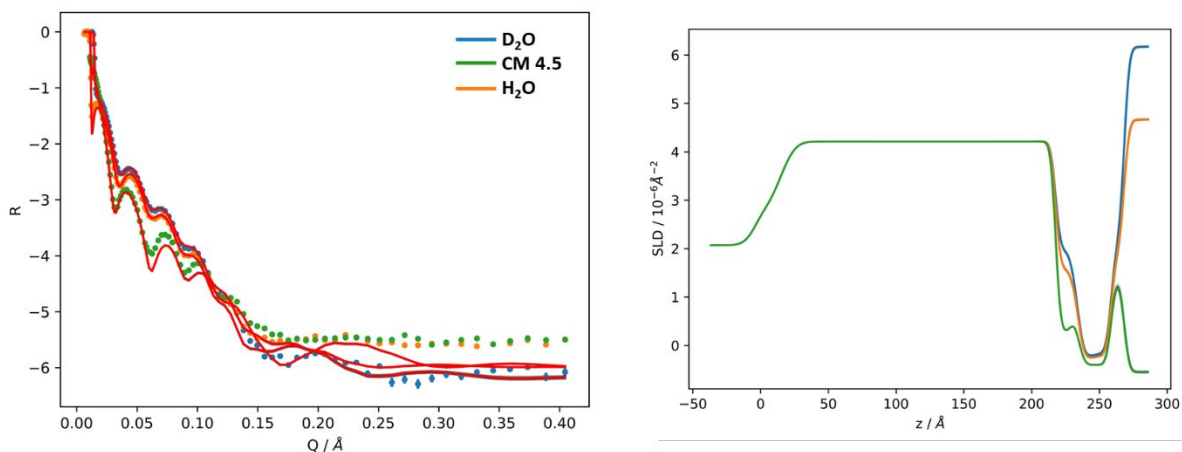


Figure S 5: Scattering plot (left) and SLD plot (right) of Initial bilayer fitted with a MCMC algorithm. The grey shadows of the lines represent the error calculated during the fitting process. Errors shown in this figure are considerably lower, as most parameters were not allowed to vary during the fitting process and thus a n error could not be estimated.

Table S 5: Neutron sample 2 parameters and errors. Thicknesses are given in Å, SLD in 10^{-6} Å^{-2} , hydration in volume-% and roughness is in Å with respect to the preceding layer. Where no error is shown, the parameter was not allowed to vary during fitting.

	Initial Bilayer		After Colistin/NP treatment	
	Parameter	Error	Parameter	error
Scale factor	0.90	0.01	0.98	0.00
Si SLD	2.07		2.07	
SiO ₂ thickness	4.19	1.87	4.19	
SiO ₂ SLD	3.47		3.47	
SiO ₂ hydration	0.0		0.0	
SiO ₂ roughness	4.86	1.67	4.86	
Cr thickness	11.94	2.16	11.94	
Cr SLD	3.03		3.03	
Cr hydration	0.0		0.0	
Cr roughness	4.39	0.94	4.39	
Au thickness	190.35	1.30	190.35	
Au SLD	4.50	0.01	4.50	
Au hydration	0.0		0.0	
Au roughness	3.63	0.51	3.63	
Tether thickness	12.22	0.09	12.22	
Tether SLD	1.39	0.22	1.39	
Tether roughness	4.72	0.12	4.72	
Tether hydration	0.28	0.03	0.28	
Inner HG thickness	4.00	0.08	4.00	
Inner HG SLD	1.15	0.24	1.15	
Inner HG roughness	5.49	2.32	5.49	
Inner HG hydration	0.17	0.03	0.17	
Inner HC thickness	12.35	0.10	12.35	
Inner HC SLD	-0.40	0.05	-0.40	
Inner HC roughness	5.23	0.74	4.65	
Inner HC hydration	0.01	0.01	0.01	
Outer HC thickness	12.16	0.16	12.01	
Outer HC SLD	-0.35	0.03	-0.35	
Outer HC roughness	3.34	0.91	13.52	2.53
Outer HC hydration	0.05	0.01	0.05	0.00
Outer HG thickness	7.36	0.61	8.12	0.16
Outer HG SLD	2.32	0.32	1.70	0.03
Outer HG roughness	5.37	0.61	3.03	0.06
Outer HG hydration	0.63	0.03	0.16	0.02
Solvent SLD	6.32	0.00	6.30	0.00
Solvent roughness	7.70	1.23	9.34	0.25

Abbreviations: HC: hydrocarbon chains, HG: head group, SLD: scattering length density

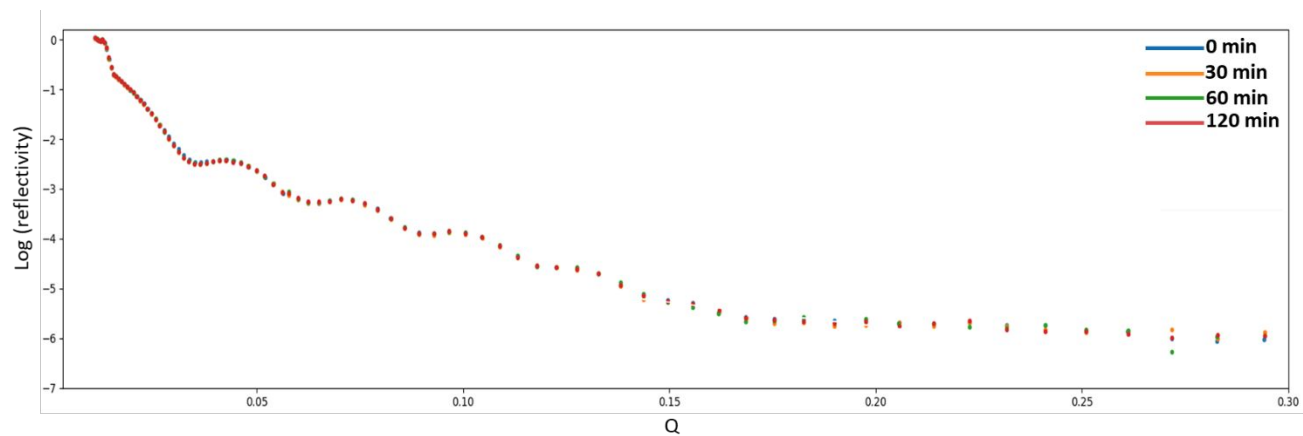


Figure S 6: Successive measurements taken of sample 2 in D_2O during the incubation with gold nanoparticles. No change was visible after two hours.