

Electronic Supplementary Information

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Modulation of the translocation of peptides through nanopores by the application of an AC electric field.

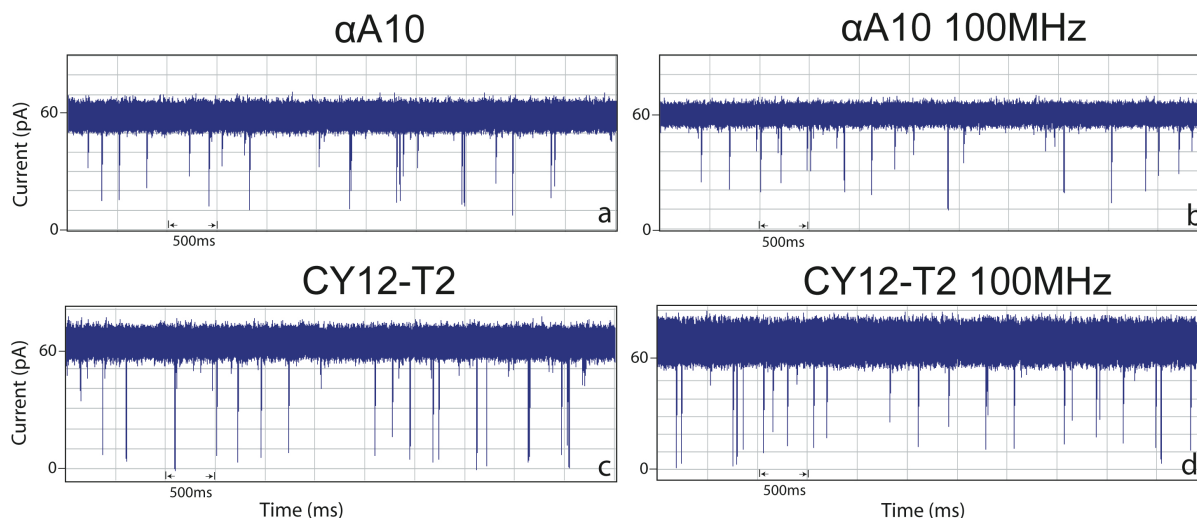


Figure S1. Current time traces for α A10 and CY12(-)T2 with and without an AC field of 200 mV at 100MHz.

It can be seen that the open pore current remains the same at -60 pA and there is only a small increase in electrical noise (if at all). The lipid membrane is stable with MHz frequencies but not at lower frequencies. Thus any effect on the translocation of peptides is due to the AC field and not due to alteration of other parameters.

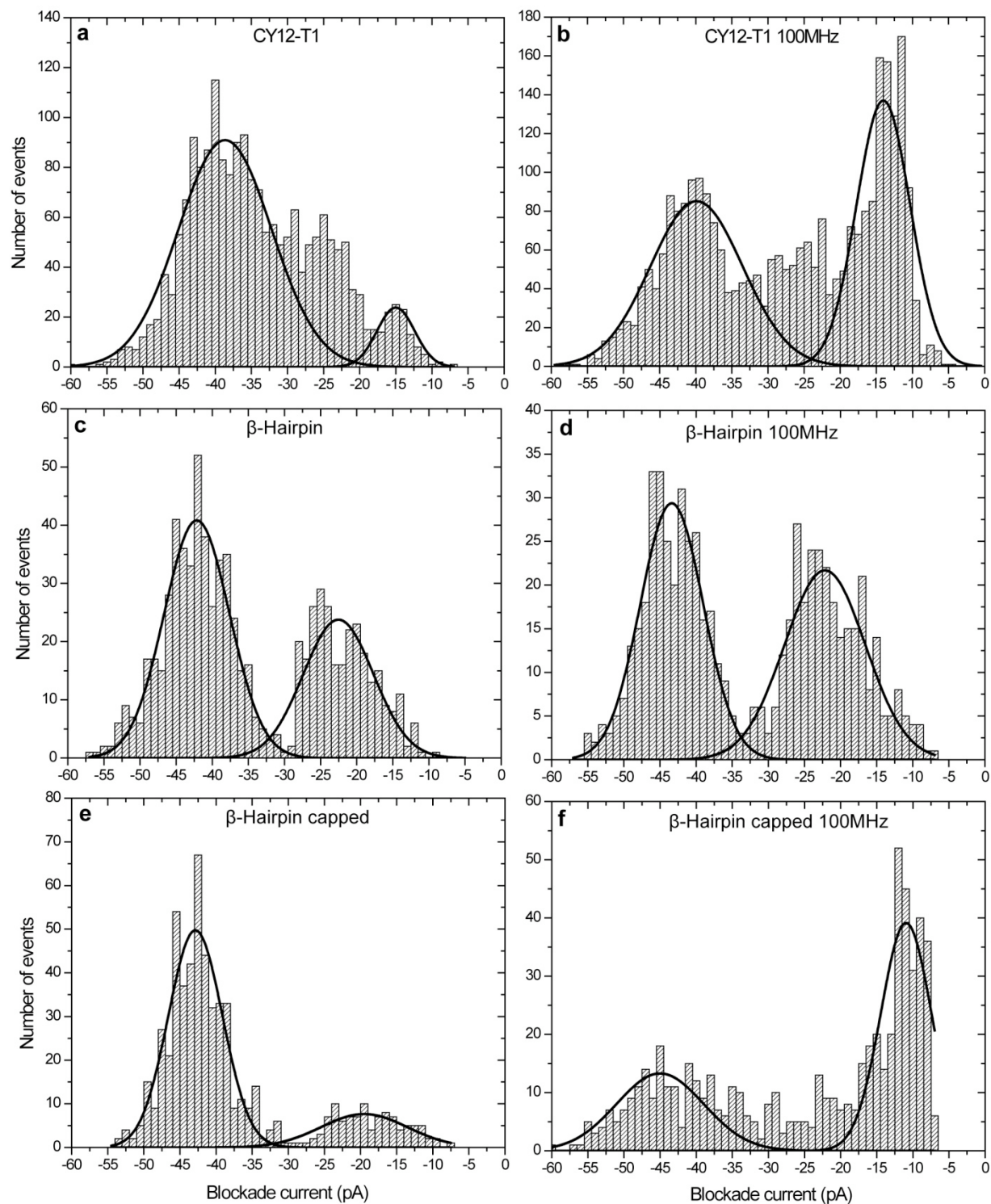


Figure S2. Effect of an AC field of 200 mV at 100 MHz on (a), (b) Cy12(-)T1; (c), (d) an uncapped β -hairpin; and (e), (f) a capped β -hairpin. The sequences of the peptides are shown in Figure 1.

Table S1. The interaction parameters of the α A10 peptide with α -hemolysin under different AC frequencies ^a.

α A10/AC	I_1 (pA)	I_2 (pA)	T_1 (ms)	T_2 (ms)	A_1	A_2	A_1/A_2	W_1	W_2
No AC	-	-40	-	0.224	-	1206	-	-	7.8
10 MHz	-25	-37	0.049	0.168	100	528	0.19	3.6	5.6
20 MHz	-27	-38	0.056	0.171	139	448	0.31	3.9	5.2
50 MHz	-30	-39	0.117	0.150	244	201	1.21	4.4	4.3
100 MHz	-26	-36	0.064	0.182	475	564	0.84	3.4	5.1
500 MHz	-30	-40	0.136	0.176	564	322	1.75	3.5	3.8

^a I_1 , I_2 , T_1 , and T_2 represent the intensities and the durations of the current blockades of the respective event populations presented in **Figure 2**. A_1 and A_2 are the number of events under the curve and W_1 and W_2 represent their width at half the maximum height. (The error is estimated to be ± 1 pA for I and $\pm 10\%$ for T).

Table S2. The interaction parameters of the CY12(-)T2 peptide with α -hemolysin under different AC frequencies ^a.

CY12(-)T2/AC	I_1 (pA)	I_2 (pA)	T_1 (ms)	T_2 (ms)	A_1	A_2	A_1/A_2	W_1	W_2
No AC	-17	-53/-47	0.057	1.54/0.683	213	495	0.43	7.4	5.0/3.1
10 MHz	-28	-54	0.088	0.720	353	392	0.90	11.0	5.5
20 MHz	-23	-53	0.059	0.825	92	353	0.26	6.2	5.5
50 MHz	-23	-53	0.060	0.755	110	346	0.32	7.8	5.3
100 MHz	-21	-54	0.054	0.708	85	419	0.20	5.0	6.8
500 MHz	-21	-54	0.049	0.913	62	336	0.18	5.0	7.3

^a **I**₁, **I**₂, **T**₁, and **T**₂ represent the intensities and the durations of the current blockades of the respective event populations presented in **Figure 3**. **A**₁ and **A**₂ are the number of events under the curve and **W**₁ and **W**₂ represent their width at half the maximum height. (The error is estimated to be ±1 pA for **I** and ±10% for **T**).

Table S3. The interaction parameters of peptides with α -hemolysin in the absence and presence of 100 MHz AC frequency ^a.

Peptides	I ₁ (pA)	I ₂ (pA)	T ₁ (ms)	T ₂ (ms)	A ₁	A ₂	A ₁ / A ₂	W ₁	W ₂
CY12-T1	-15	-39	0.031	0.083	156	1470	0.11	5.0	12.8
100 MHz	-14	-40	0.024	0.081	1277	1362	0.94	7.3	12.7
β-Hairpin	-23	-42	0.029	0.077	289	464	0.62	9.7	9.0
100 MHz	-22	-43	0.022	0.067	304	321	0.95	11.2	8.7
β-Hairpin capped	-20	-43	0.027	0.162	115	465	0.25	11.9	7.4
100 MHz	-11	-45	0.019	0.094	342	201	1.70	6.9	12.0

^a **I**₁, **I**₂, **T**₁, and **T**₂ represent the intensities and the durations of the current blockades of the respective event populations presented in **Figure S2**. **A**₁ and **A**₂ are the number of events under the curve and **W**₁ and **W**₂ represent their width at half the maximum height. (The error is estimated to be ±1 pA for **I** and ±10% for **T**).