FIG. 1

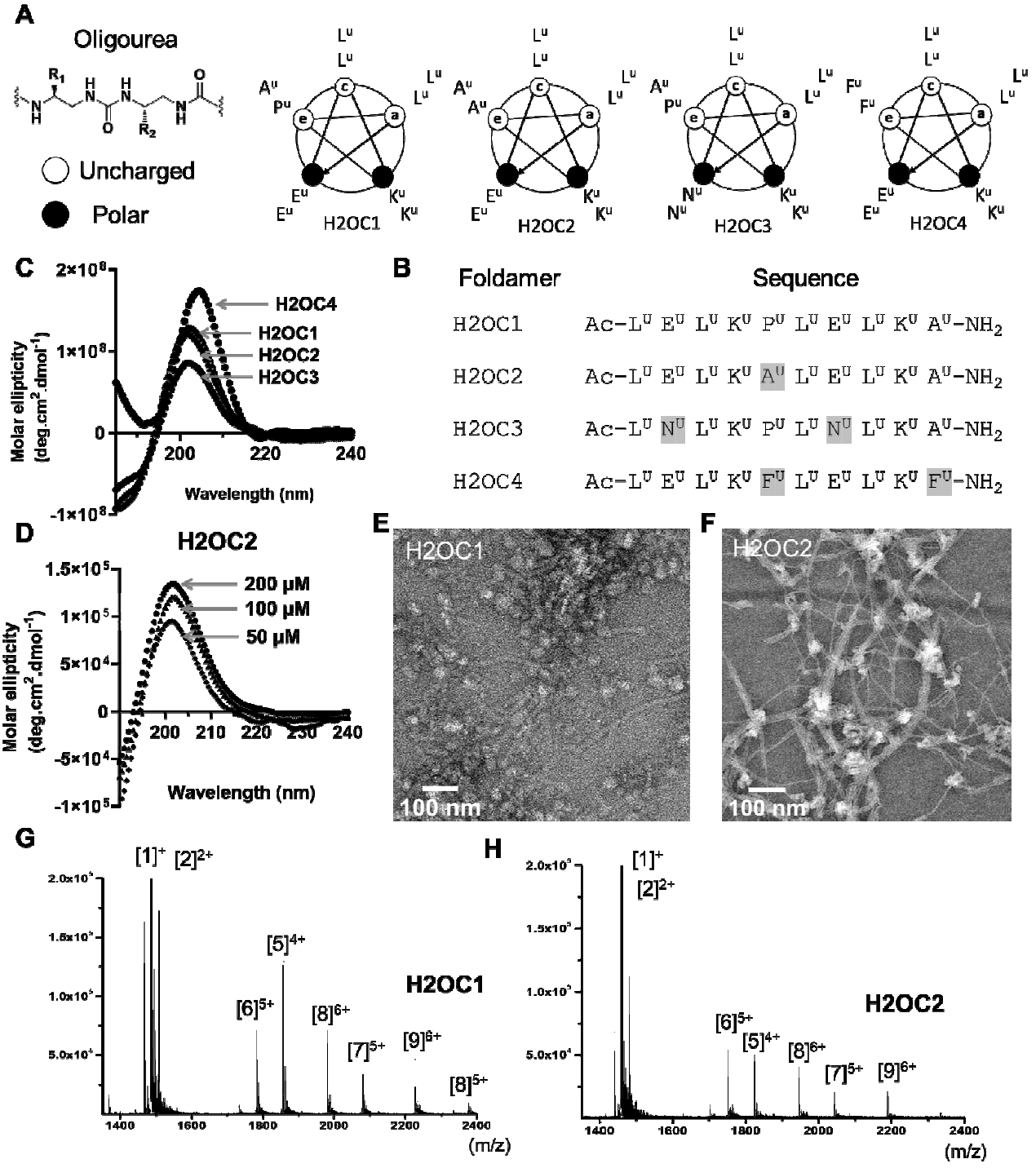

A
Oligourea
Uncharged
Polar
H2OC1
H2OC2
H2OC3
H2OC4
B
Foldamer
Sequence
H2OC1 Ac-L^U E^U L^U K^U P^U L^U E^U L^U K^U A^U-NH2
H2OC2 Ac-L^U E^U L^U K^U A^U L^U E^U L^U K^U A^U-NH2
H2OC3 Ac-L^U N^U L^U K^U P^U L^U N^U L^U K^U A^U-NH2
H2OC4 Ac-L^U E^U L^U K^U F^U L^U E^U L^U K^U F^U-NH2
C
Molar ellipticity (deg.cm2.dmol-1)
Wavelength (nm)
H2OC4
H2OC1
H2OC2
H2OC3
D
H2OC2
200 µM
100 µM
50 µM
Molar ellipticity (deg.cm2.dmol-1)
Wavelength (nm)
E
H2OC1
100 nm
F
H2OC2
100 nm
G
[1]+ [2]2+
[5]4+
[6]5+
[8]6+
[7]5+
[9]6+
[8]5+
H2OC1
(m/z)
H
[1]+
[2]2+
[6]5+
[5]4+
[8]6+
[7]5+
[9]6+
H2OC2
(m/z)

FIG. 2

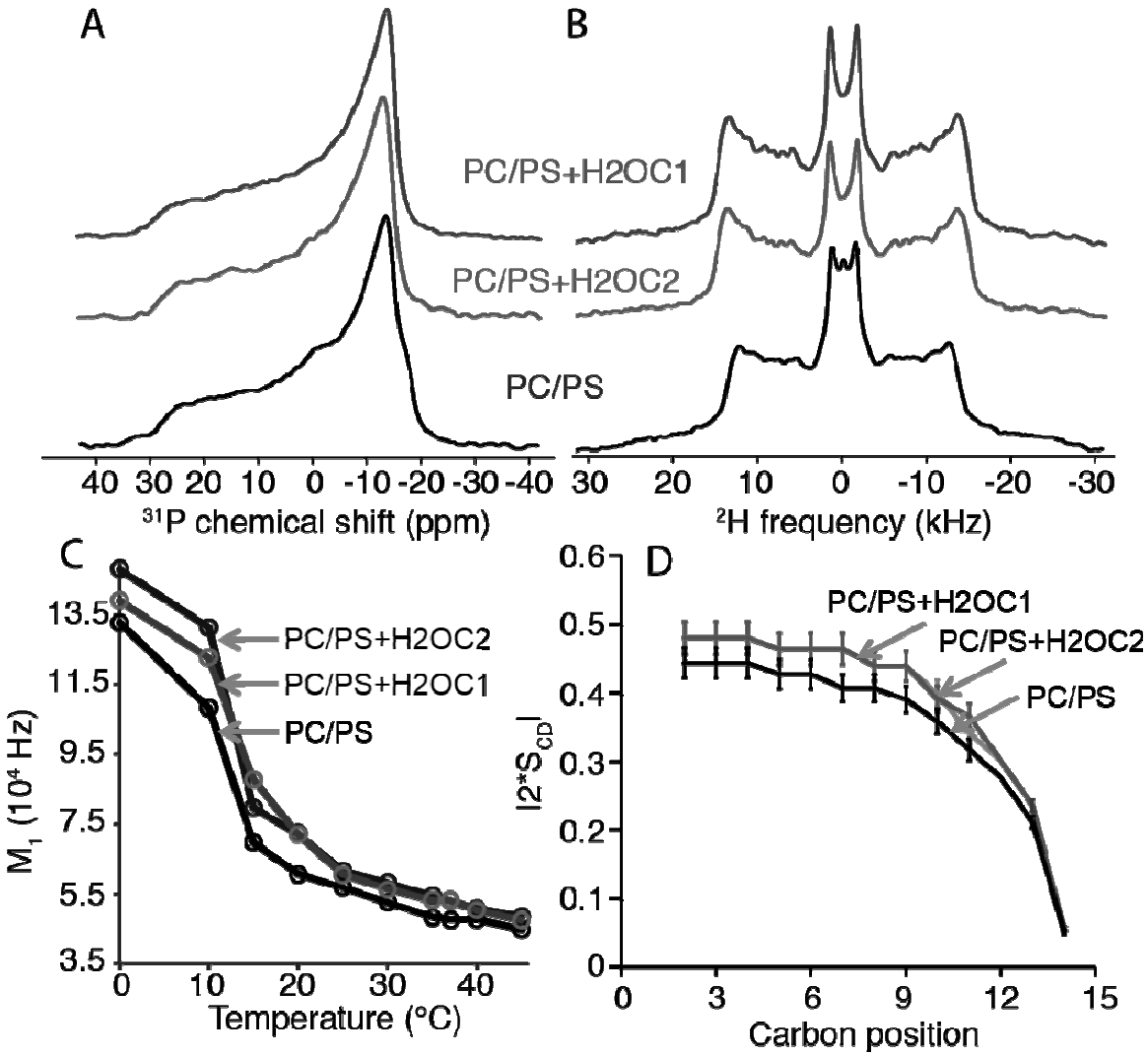

A
B
PC/PS+H2OC1
PC/PS+H2OC2
PC/PS
40 30 20 10 0 -10 -20 -30 -40
31P chemical shift (ppm)
30 20 10 0 -10 -20 -30
2H frequency (kHz)
C
13.5
11.5
9.5
7.5
5.5
3.5
M1 (10^4 Hz)
0 10 20 30 40
Temperature (°C)
PC/PS+H2OC2
PC/PS+H2OC1
PC/PS
D
0.6
0.5
0.4
0.3
0.2
0.1
0
|2*SCD|
0 3 6 9 12 15
Carbon position
PC/PS+H2OC1
PC/PS+H2OC2
PC/PS

FIG. 3

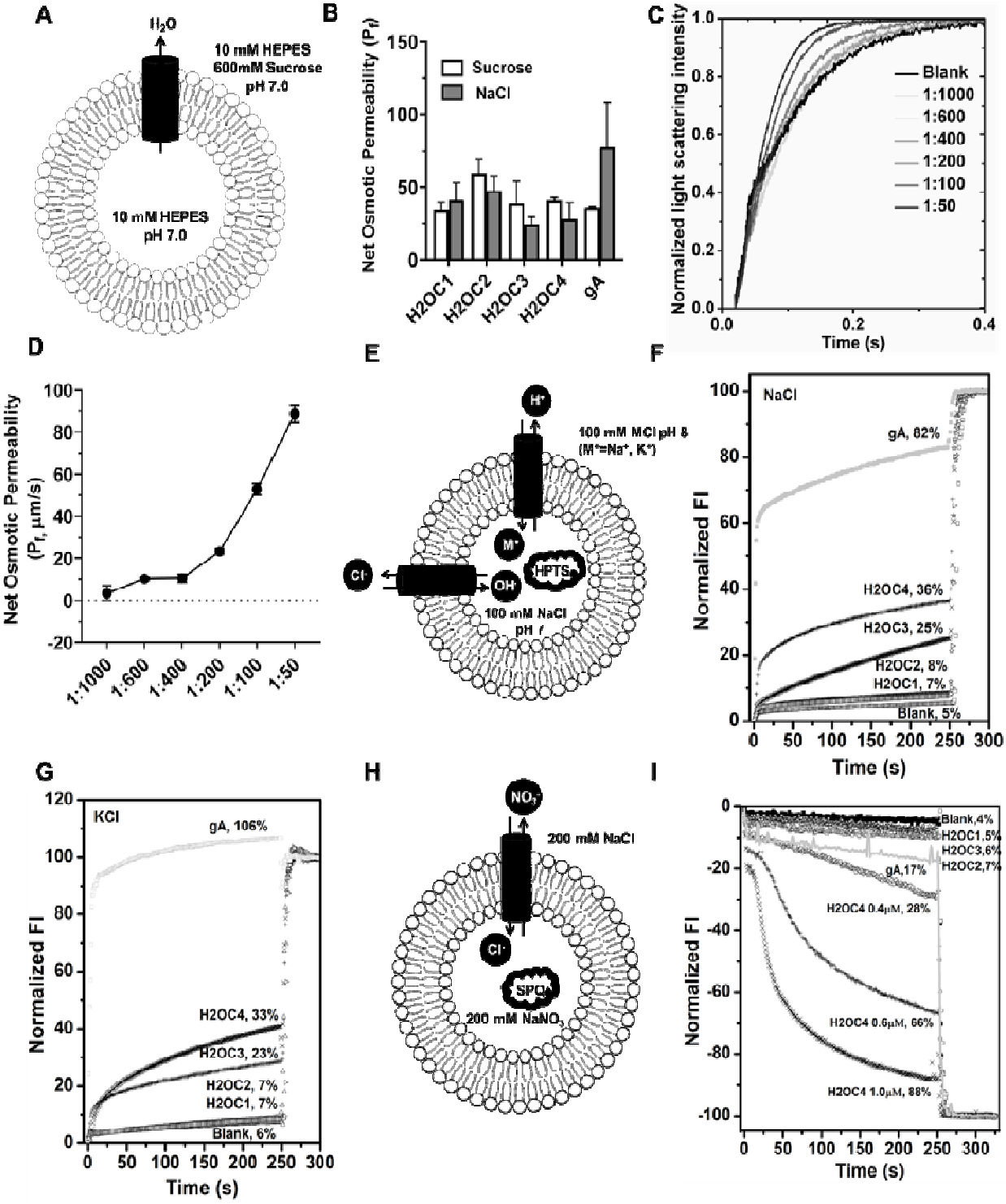

A
H_2O
10 mM HEPES
600mM Sucrose
pH 7.0
10 mM HEPES
pH 7.0
B
Net Osmotic Permeability (P_f)
Sucrose
NaCl
H2OC1
H2OC2
H2OC3
H2OC4
gA
C
Normalized light scattering intensity
Blank
1:1000
1:600
1:400
1:200
1:100
1:50
Time (s)
D
Net Osmotic Permeability (P_f, μm/s)
1:1000
1:600
1:400
1:200
1:100
1:50
E
H^+
100 mM MCl pH 8
(M^+=Na^+, K^+)
M^+
Cl^-
OH^-
HPTS
100 mM NaCl
pH 7
F
NaCl
gA, 82%
H2OC4, 36%
H2OC3, 25%
H2OC2, 8%
H2OC1, 7%
Blank, 5%
Normalized FI
Time (s)
G
KCl
gA, 106%
H2OC4, 33%
H2OC3, 23%
H2OC2, 7%
H2OC1, 7%
Blank, 6%
Normalized FI
Time (s)
H
NO_3^-
200 mM NaCl
Cl^-
SPQ
200 mM $NaNO_3$
I
Blank,4%
H2OC1,5%
H2OC3,6%
H2OC2,7%
gA,17%
H2OC4 0.4μM, 28%
H2OC4 0.6μM, 66%
H2OC4 1.0μM, 88%
Normalized FI
Time (s)

FIG. 4

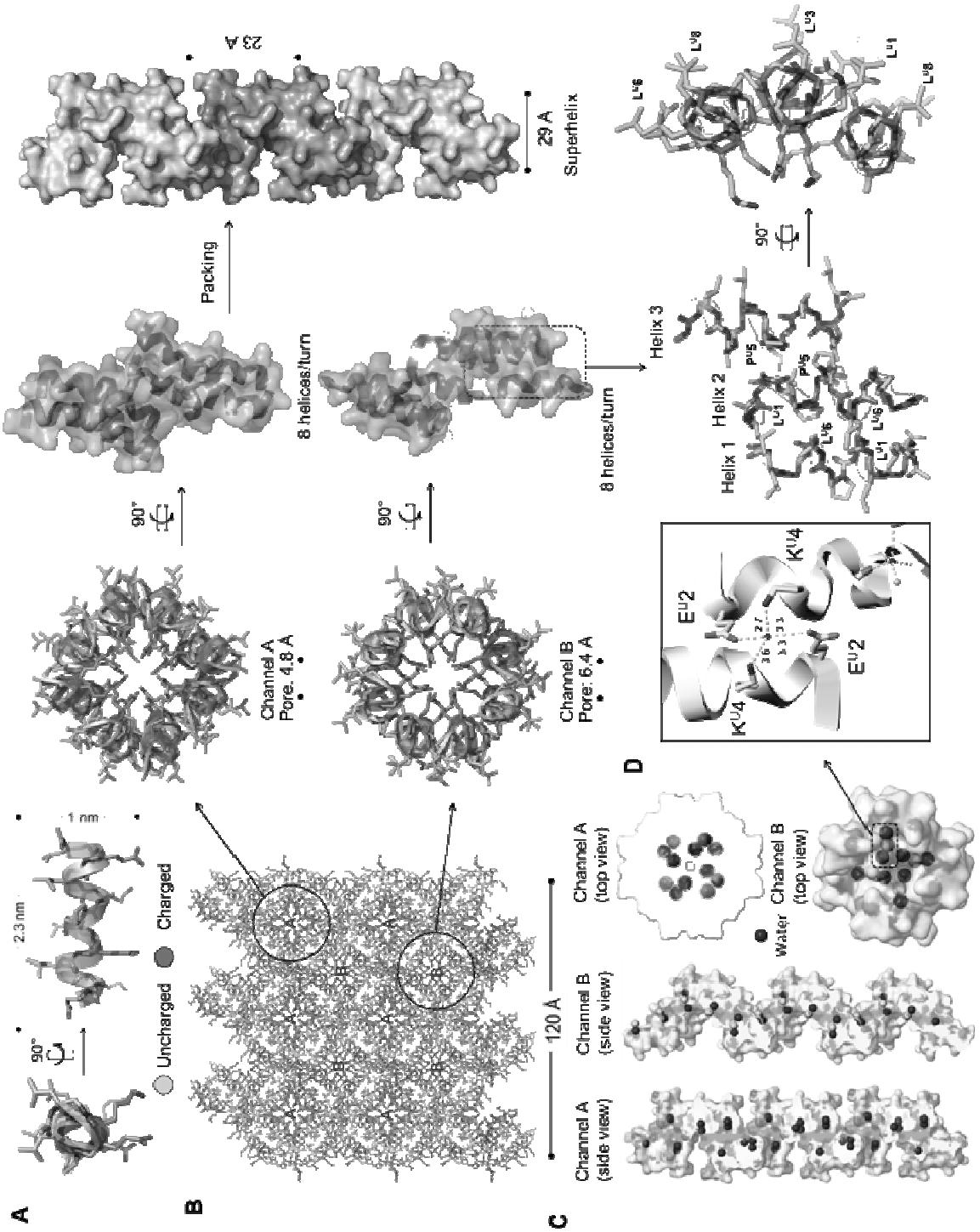

A
1 nm
2.3 nm
90°
Uncharged
Charged
B
Channel A
Pore: 4.8 Å
Channel B
Pore: 6.4 Å
90°
90°
8 helices/turn
8 helices/turn
Packing
23 Å
29 Å
Superhelix
Helix 3
Helix 1
Helix 2
90°
C
120 Å
Channel A
(side view)
Channel B
(side view)
Channel A
(top view)
Channel B
(top view)
Water
D

FIG. 5

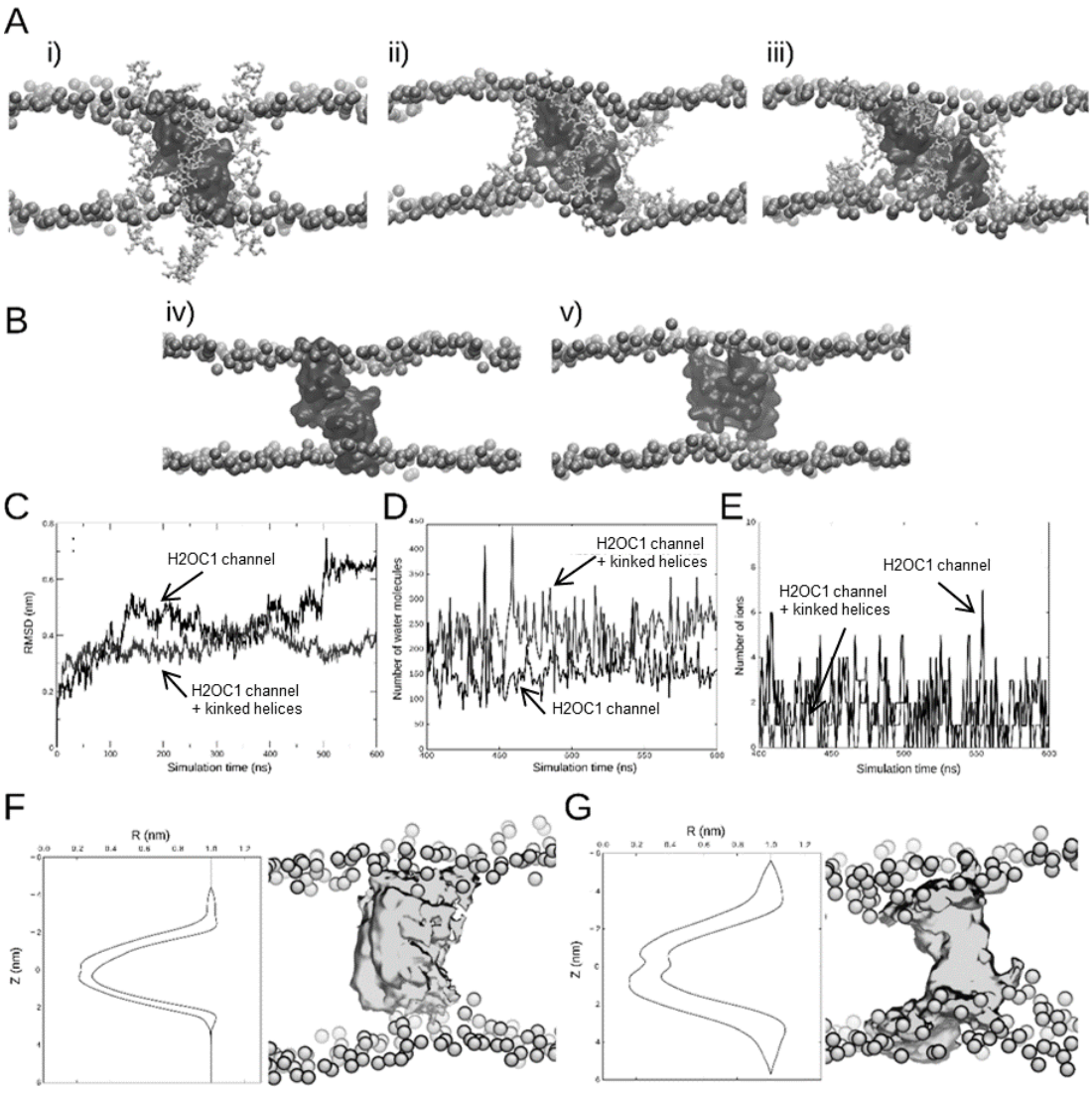

A
i)
ii)
iii)
B
iv)
v)
C
RMSD (nm)
H2OC1 channel
H2OC1 channel
+ kinked helices
Simulation time (ns)
D
Number of water molecules
H2OC1 channel
+ kinked helices
H2OC1 channel
Simulation time (ns)
E
Number of ions
H2OC1 channel
H2OC1 channel
+ kinked helices
Simulation time (ns)
F
R (nm)
Z (nm)
G
R (nm)
Z (nm)

FIG. 6

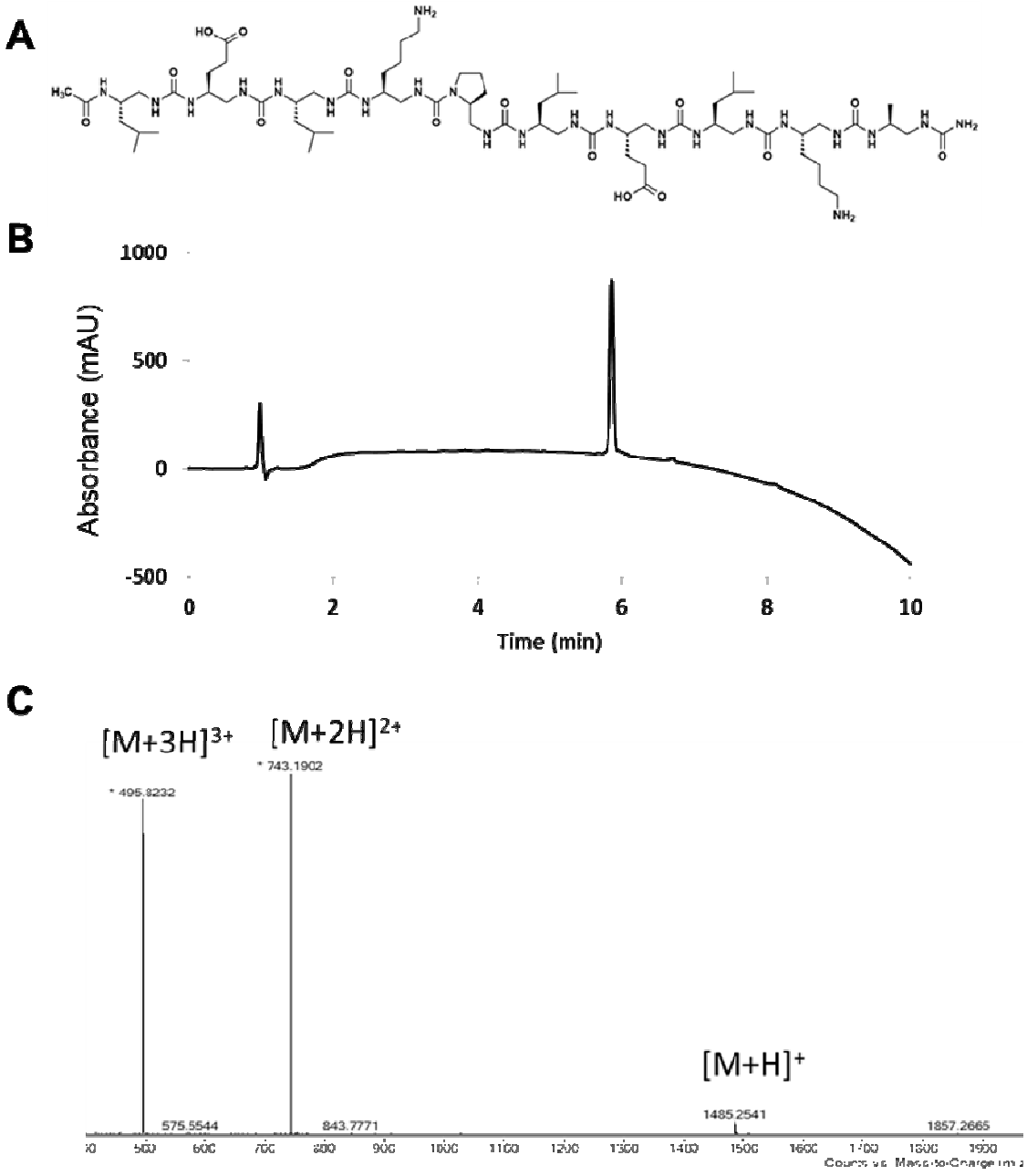

A
B
1000
500
0
-500
Absorbance (mAU)
0
2
4
6
8
10
Time (min)
C
[M+3H]3+
[M+2H]2+
* 743.1902
* 495.8232
[M+H]+
575.5544
843.7771
1485.2541
1857.2665

FIG. 7

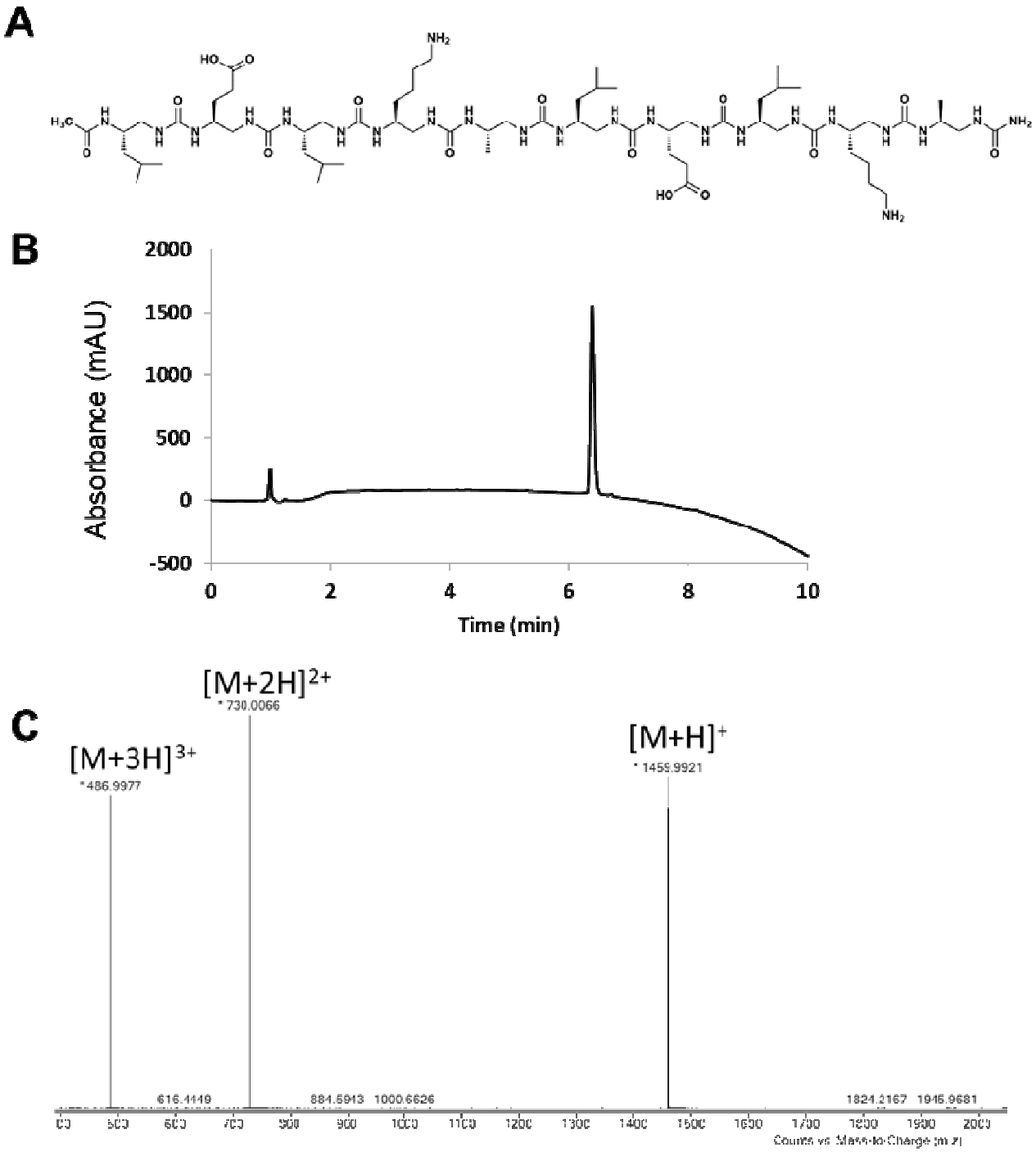

A
B
Absorbance (mAU)
2000
1500
1000
500
0
-500
0
2
4
6
8
10
Time (min)
C
[M+2H]2+
* 730.0066
[M+3H]3+
* 486.9977
[M+H]+
* 1459.9921
616.4149
881.5913
1000.6626
1824.2167
1946.9681
Counts vs. Mass-to-Charge (m/z)

FIG. 8

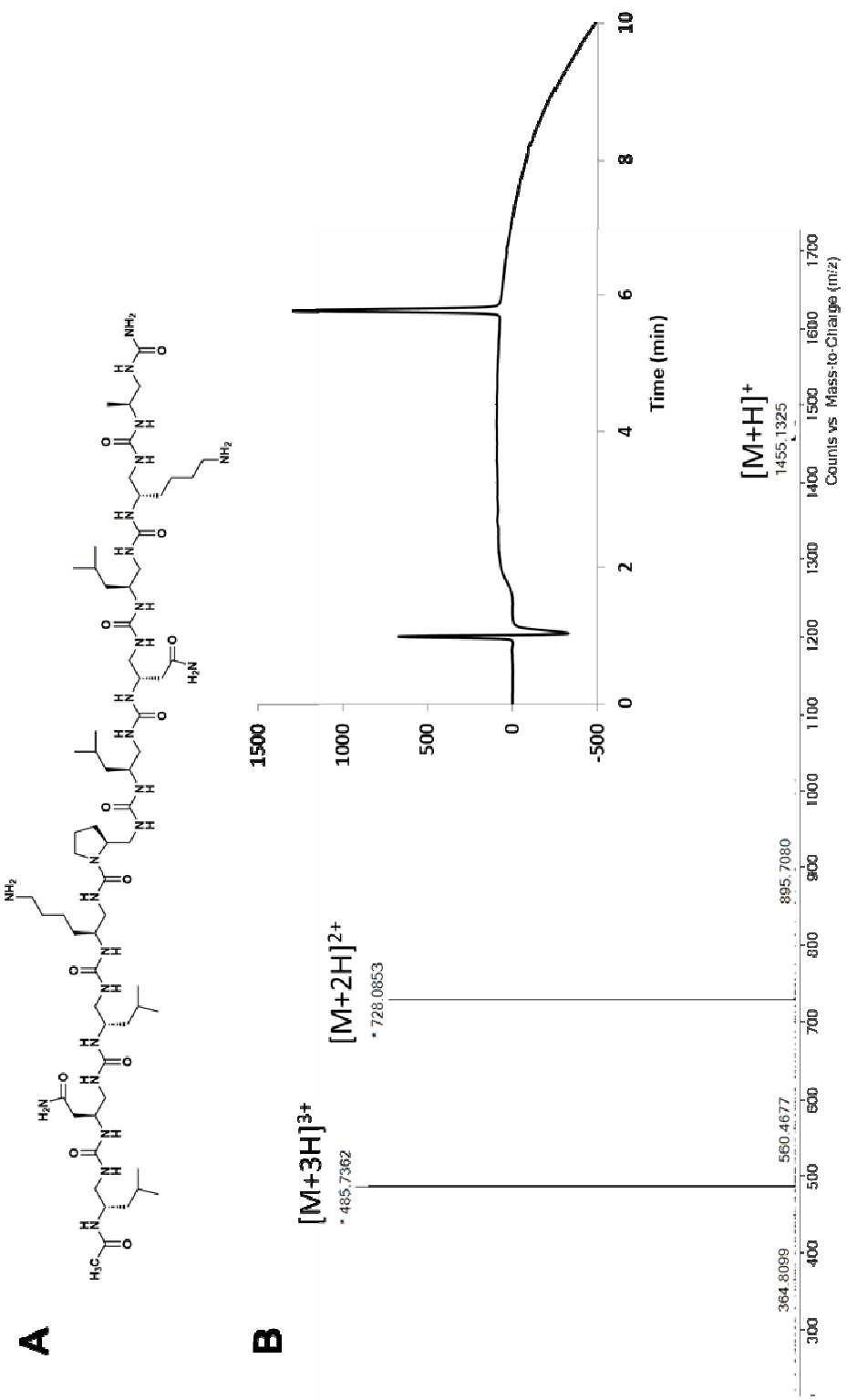

A
B
[M+3H]3+
485.7362
[M+2H]2+
728.0853
[M+H]+
1455.1325
364.8099
560.4677
895.7080
Time (min)
Counts vs. Mass-to-Charge (m/z)

FIG. 9

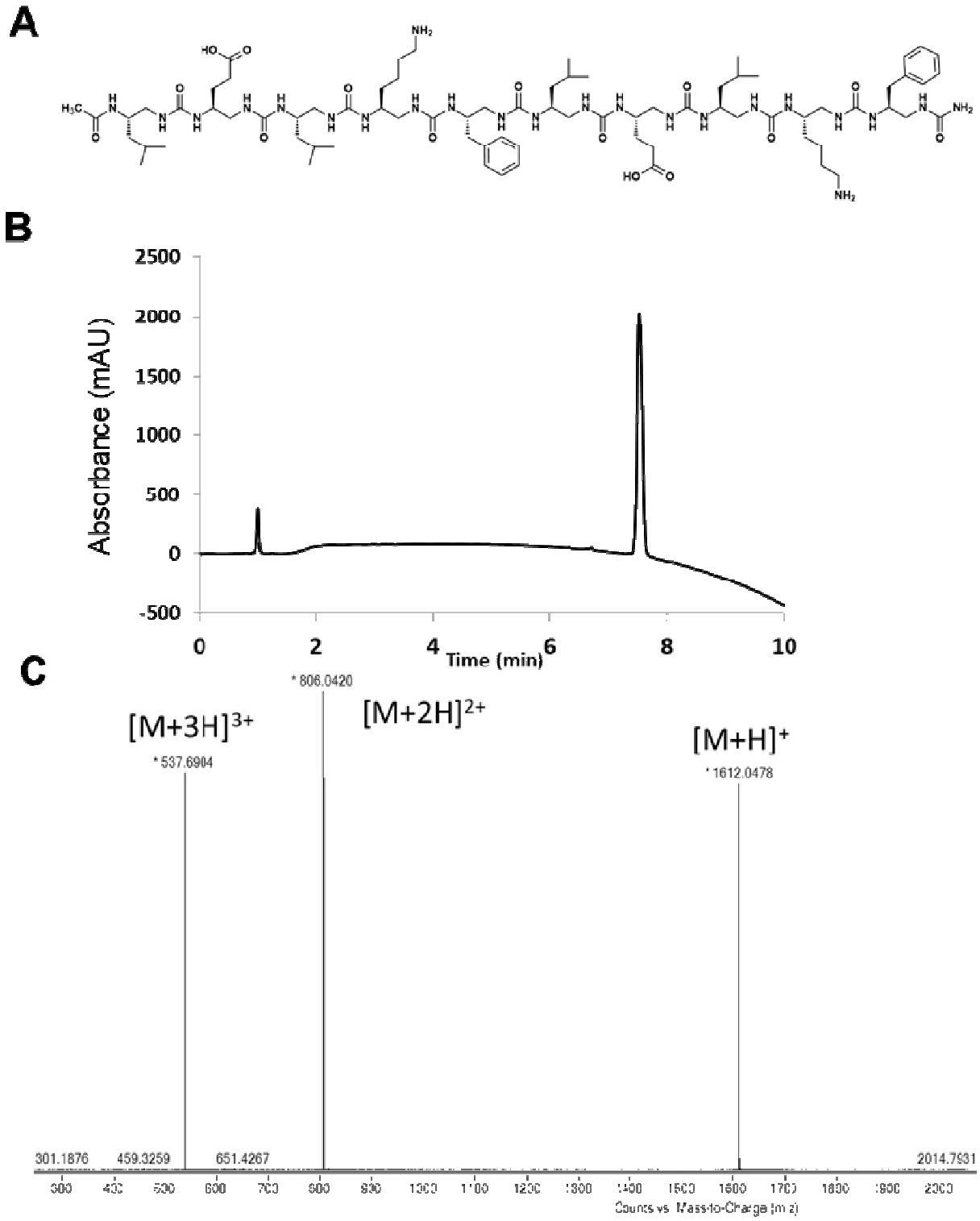

A
B
Absorbance (mAU)
2500
2000
1500
1000
500
0
-500
0
2
4
6
8
10
Time (min)
C
[M+3H]3+
*537.6904
*806.0420
[M+2H]2+
[M+H]+
*1612.0478
301.1876
459.3259
651.4267
2014.7931
Counts vs. Mass-to-Charge (m/z)

FIG. 10

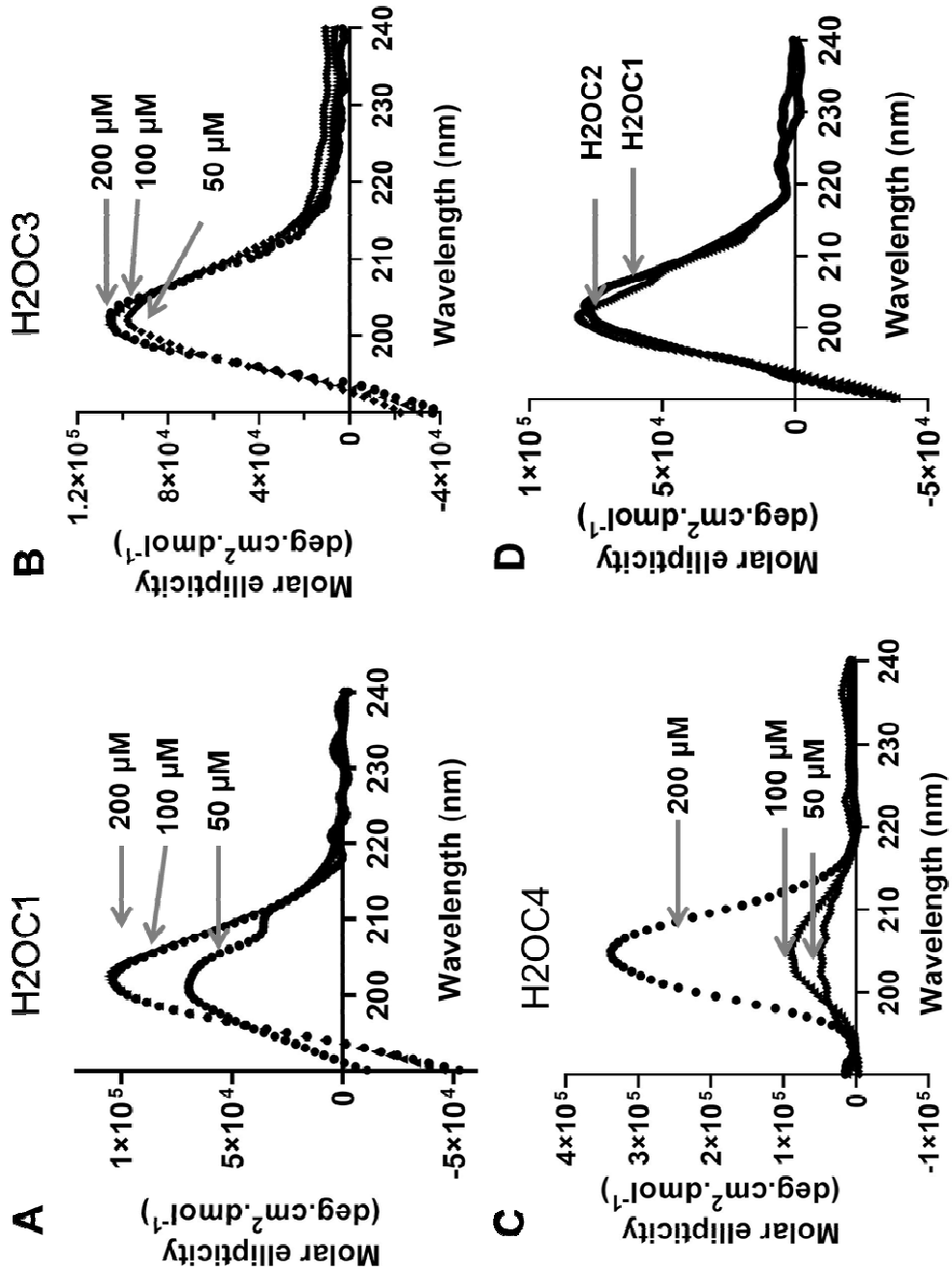

A
H2OC1
200 µM
100 µM
50 µM
Molar ellipticity
(deg.cm^2.dmol^{-1})
Wavelength (nm)
B
H2OC3
200 µM
100 µM
50 µM
Molar ellipticity
(deg.cm^2.dmol^{-1})
Wavelength (nm)
C
H2OC4
200 µM
100 µM
50 µM
Molar ellipticity
(deg.cm^2.dmol^{-1})
Wavelength (nm)
D
H2OC2
H2OC1
Molar ellipticity
(deg.cm^2.dmol^{-1})
Wavelength (nm)

FIG. 11

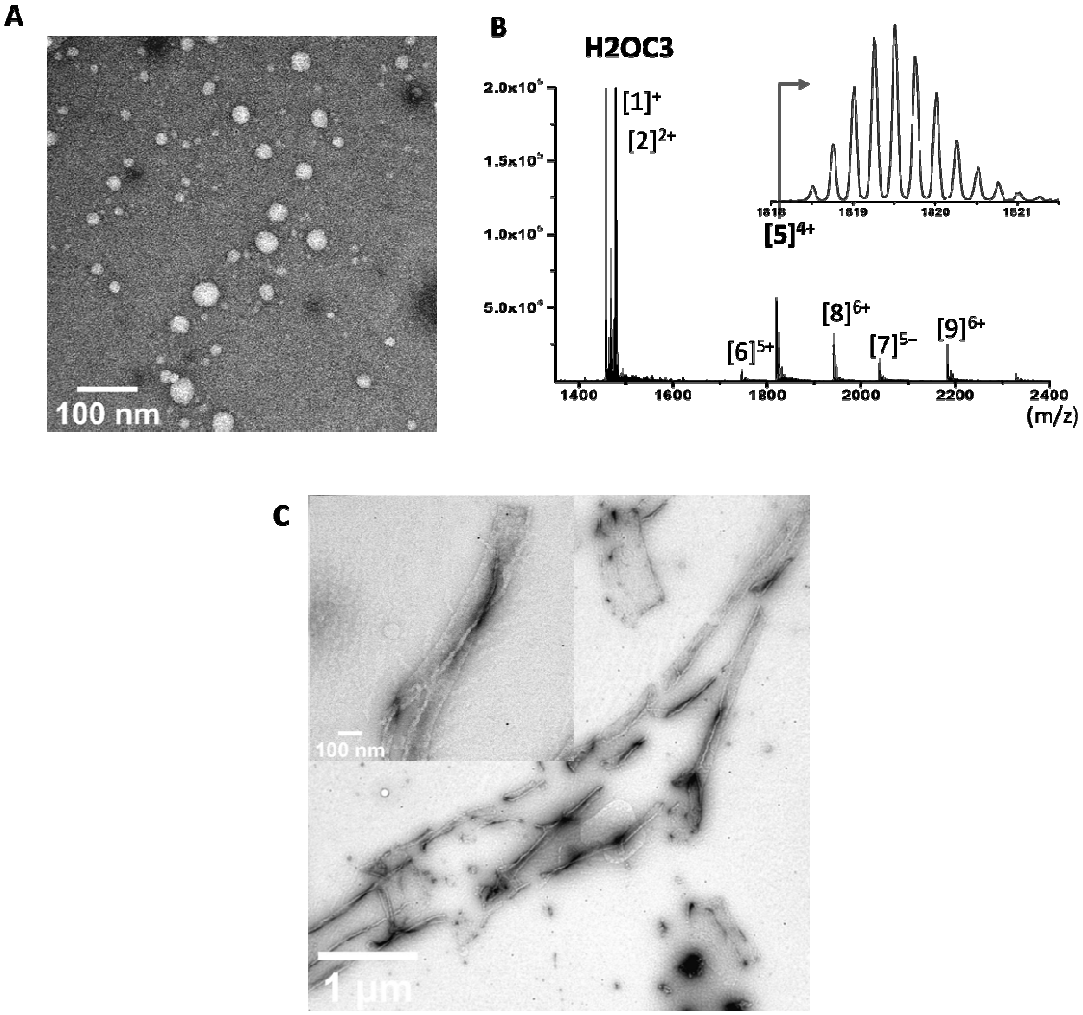


FIG. 12

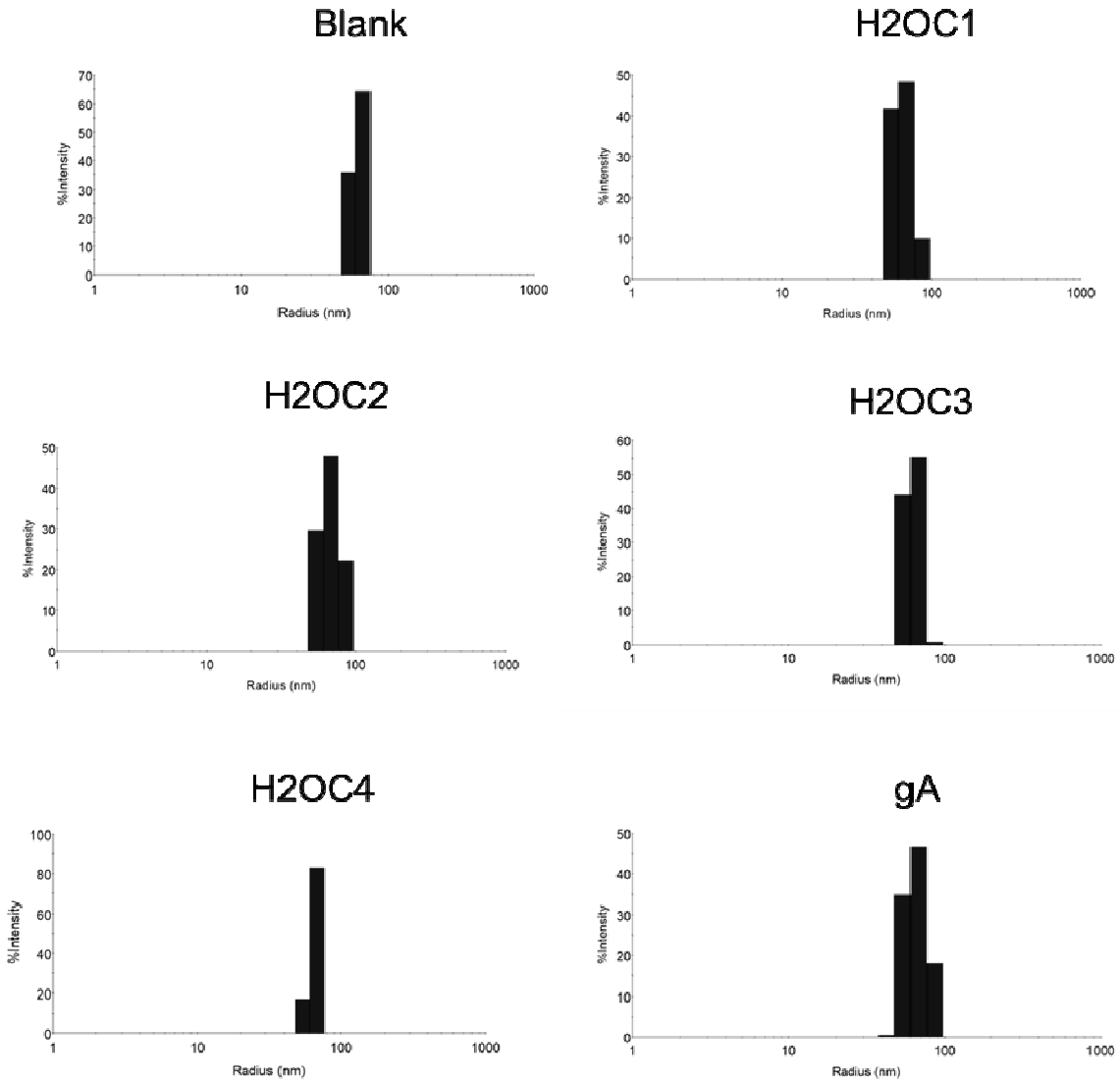

Blank
%Intensity
Radius (nm)
H2OC1
%Intensity
Radius (nm)
H2OC2
%Intensity
Radius (nm)
H2OC3
%Intensity
Radius (nm)
H2OC4
%Intensity
Radius (nm)
gA
%Intensity
Radius (nm)

FIG. 13

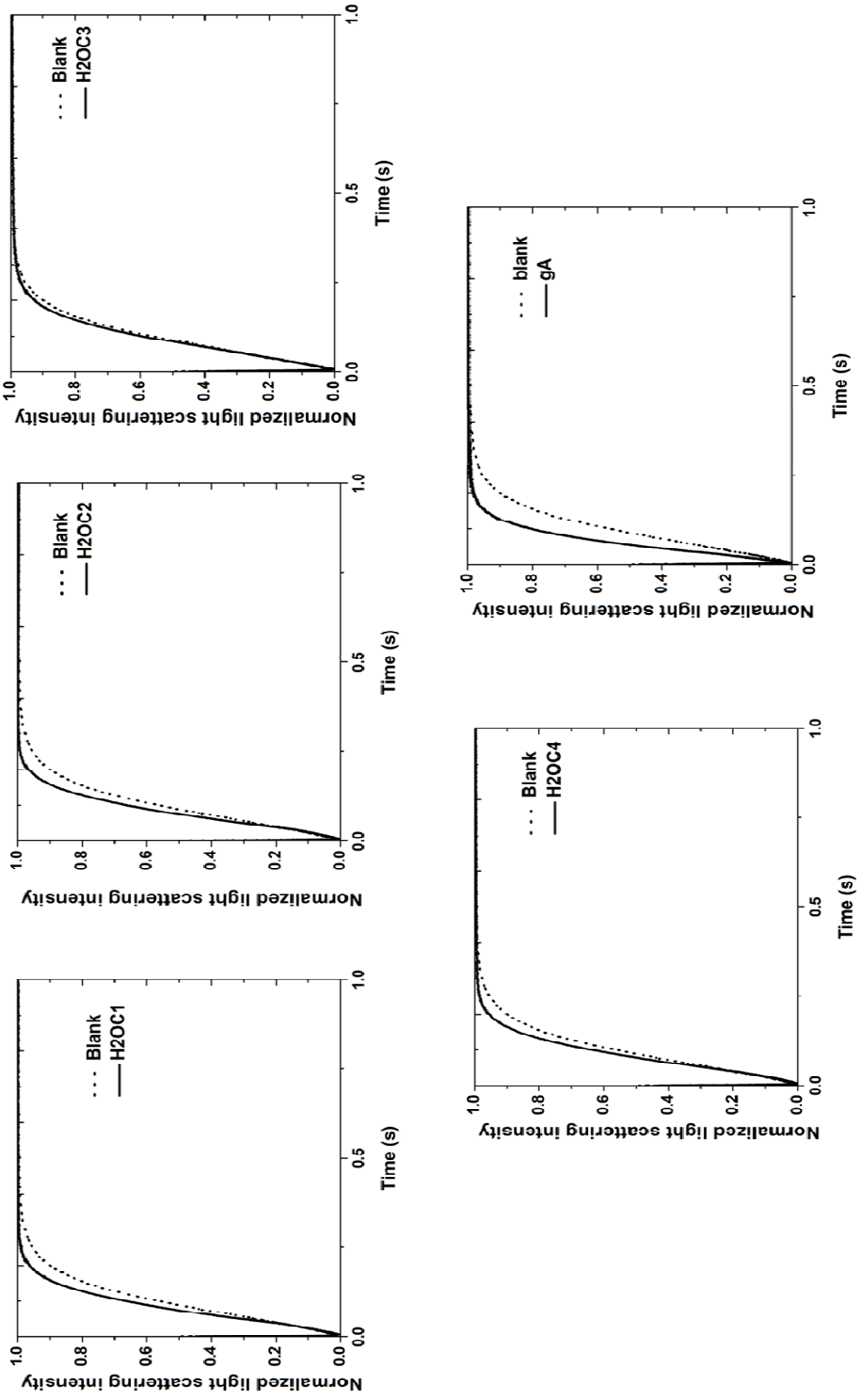

Blank
H2OC1
H2OC2
H2OC3
H2OC4
blank
gA
Normalized light scattering intensity
Time (s)
0.0
0.2
0.4
0.6
0.8
1.0
0.5

FIG. 14

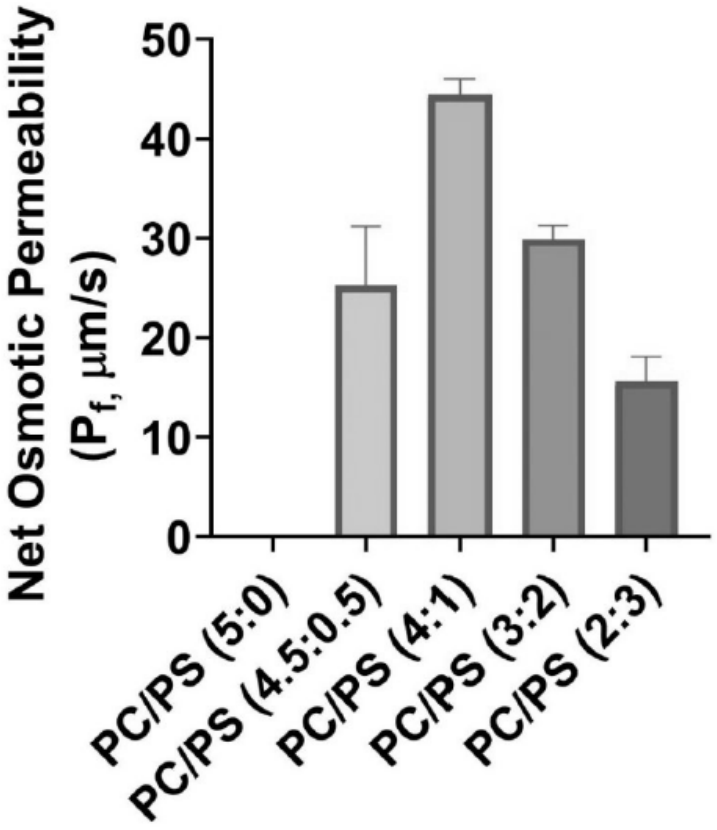

Net Osmotic Permeability
(P_f, μm/s)
50
40
30
20
10
0
PC/PS (5:0)
PC/PS (4.5:0.5)
PC/PS (4:1)
PC/PS (3:2)
PC/PS (2:3)

FIG. 15

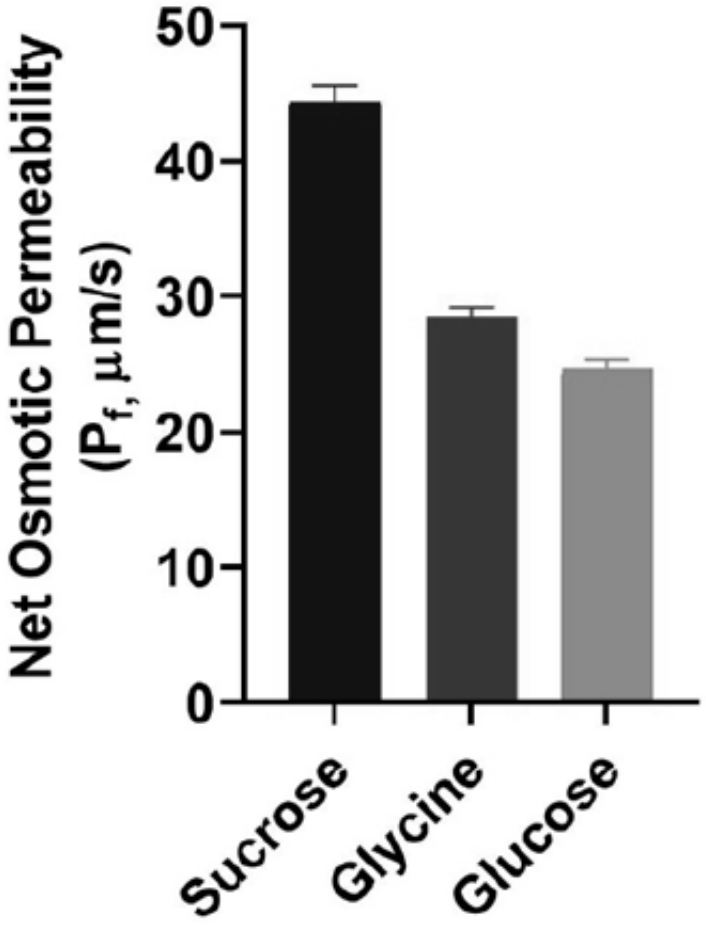

Net Osmotic Permeability
(P_f, µm/s)
50
40
30
20
10
0
Sucrose
Glycine
Glucose

FIG. 16

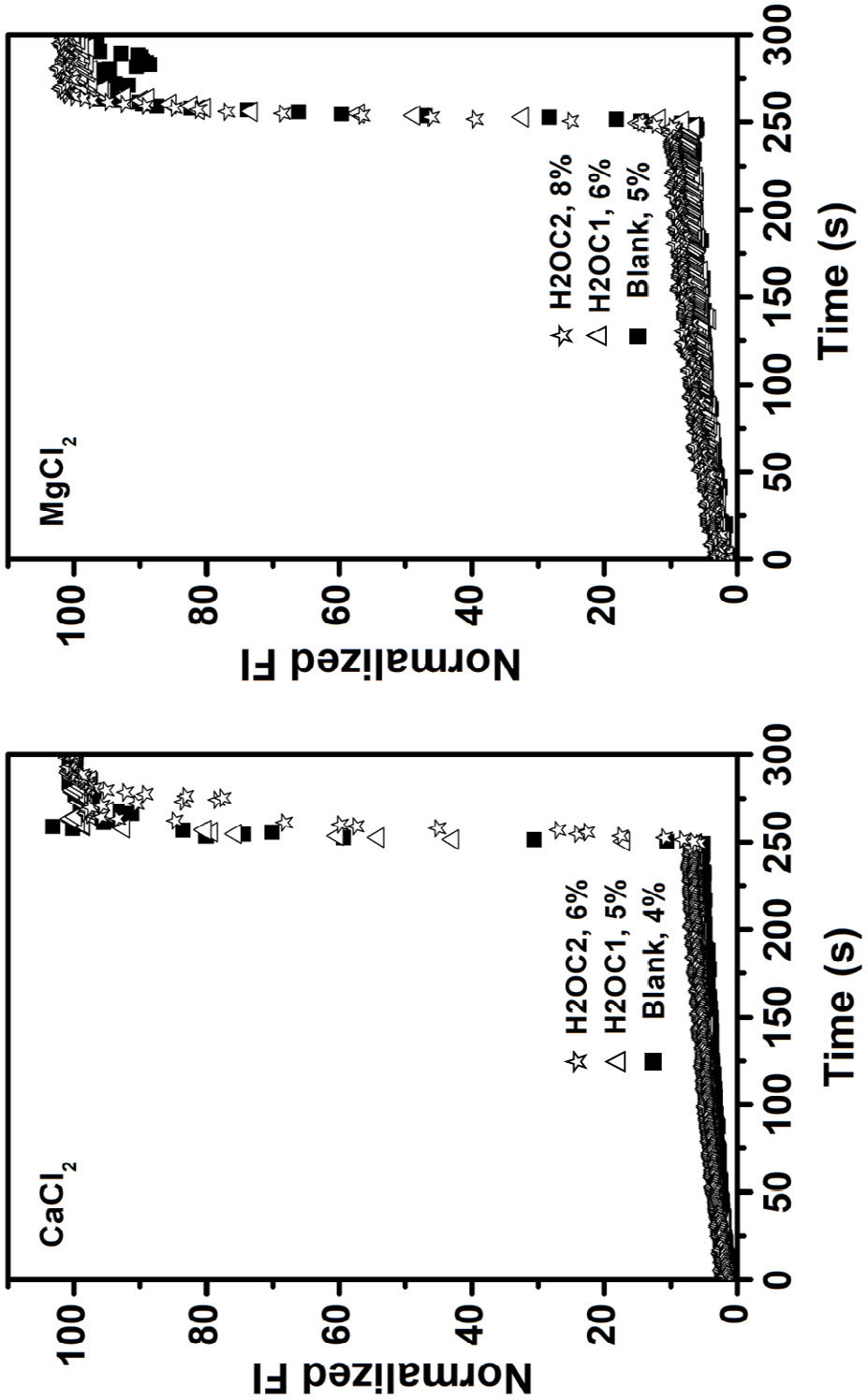

MgCl2
H2OC2, 8%
H2OC1, 6%
Blank, 5%
Normalized FI
Time (s)
CaCl2
H2OC2, 6%
H2OC1, 5%
Blank, 4%
Normalized FI
Time (s)

FIG. 17

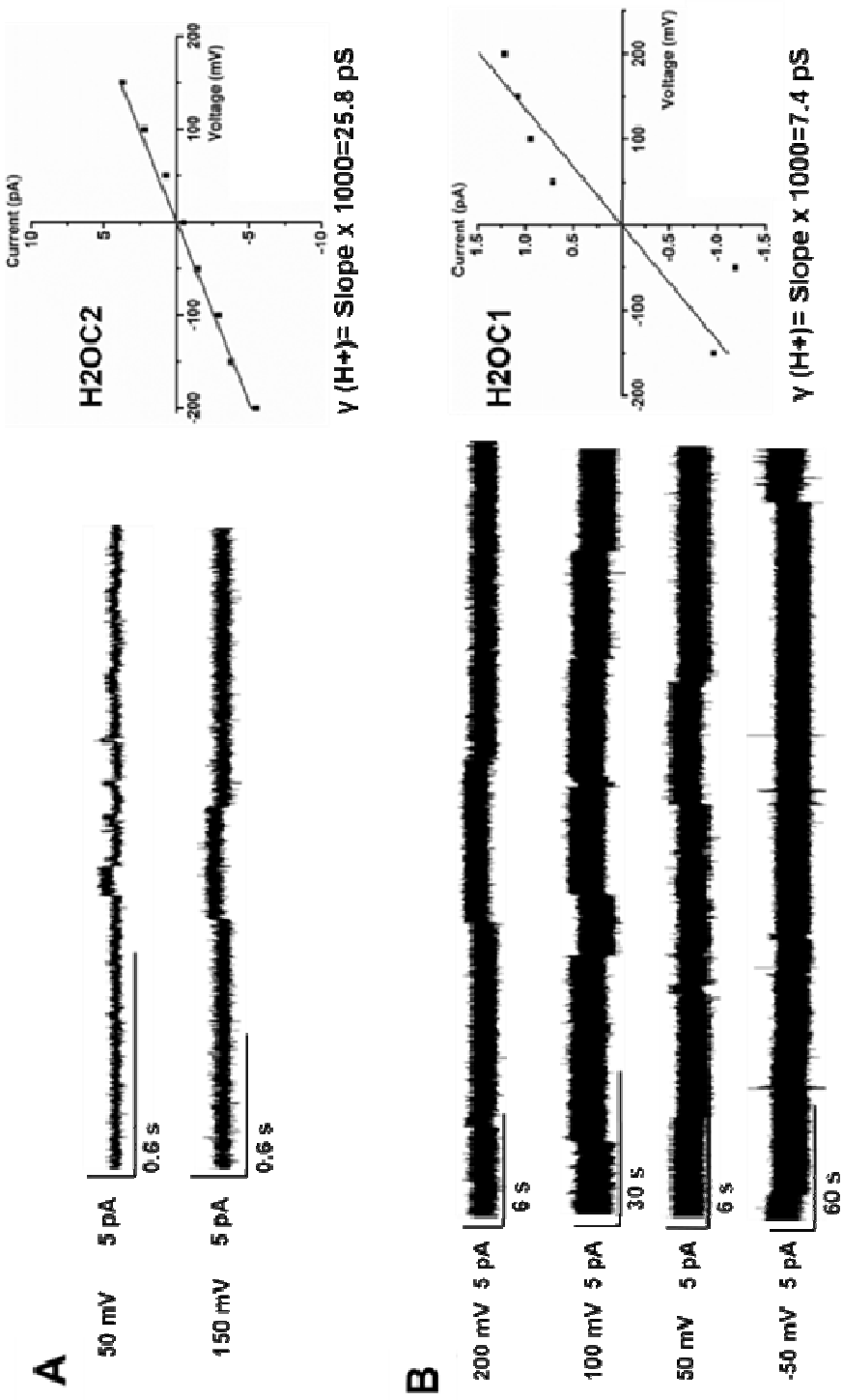

A
50 mV
5 pA
0.6 s
150 mV
5 pA
0.6 s
H2OC2
Current (pA)
Voltage (mV)
γ (H+)= Slope x 1000=25.8 pS
B
200 mV
5 pA
6 s
100 mV
5 pA
30 s
50 mV
5 pA
6 s
-50 mV
5 pA
60 s
H2OC1
Current (pA)
Voltage (mV)
γ (H+)= Slope x 1000=7.4 pS

FIG. 18

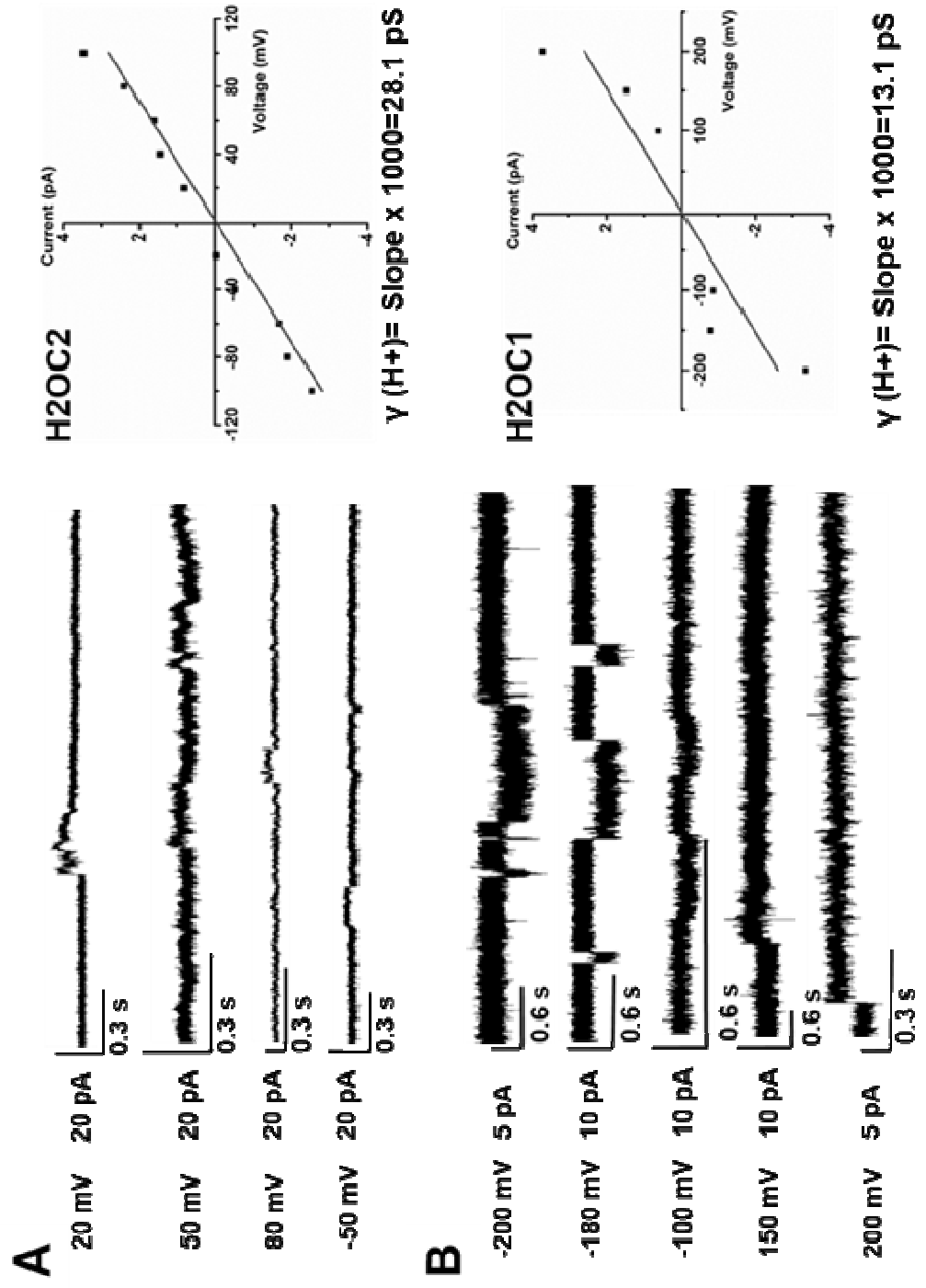

A
20 mV 20 pA
0.3 s
50 mV 20 pA
0.3 s
80 mV 20 pA
0.3 s
-50 mV 20 pA
0.3 s
H2OC2
Current (pA)
Voltage (mV)
γ (H+)= Slope x 1000=28.1 pS
B
-200 mV 5 pA
0.6 s
-180 mV 10 pA
0.6 s
-100 mV 10 pA
0.6 s
150 mV 10 pA
0.6 s
200 mV 5 pA
0.3 s
H2OC1
Current (pA)
Voltage (mV)
γ (H+)= Slope x 1000=13.1 pS

FIG. 19

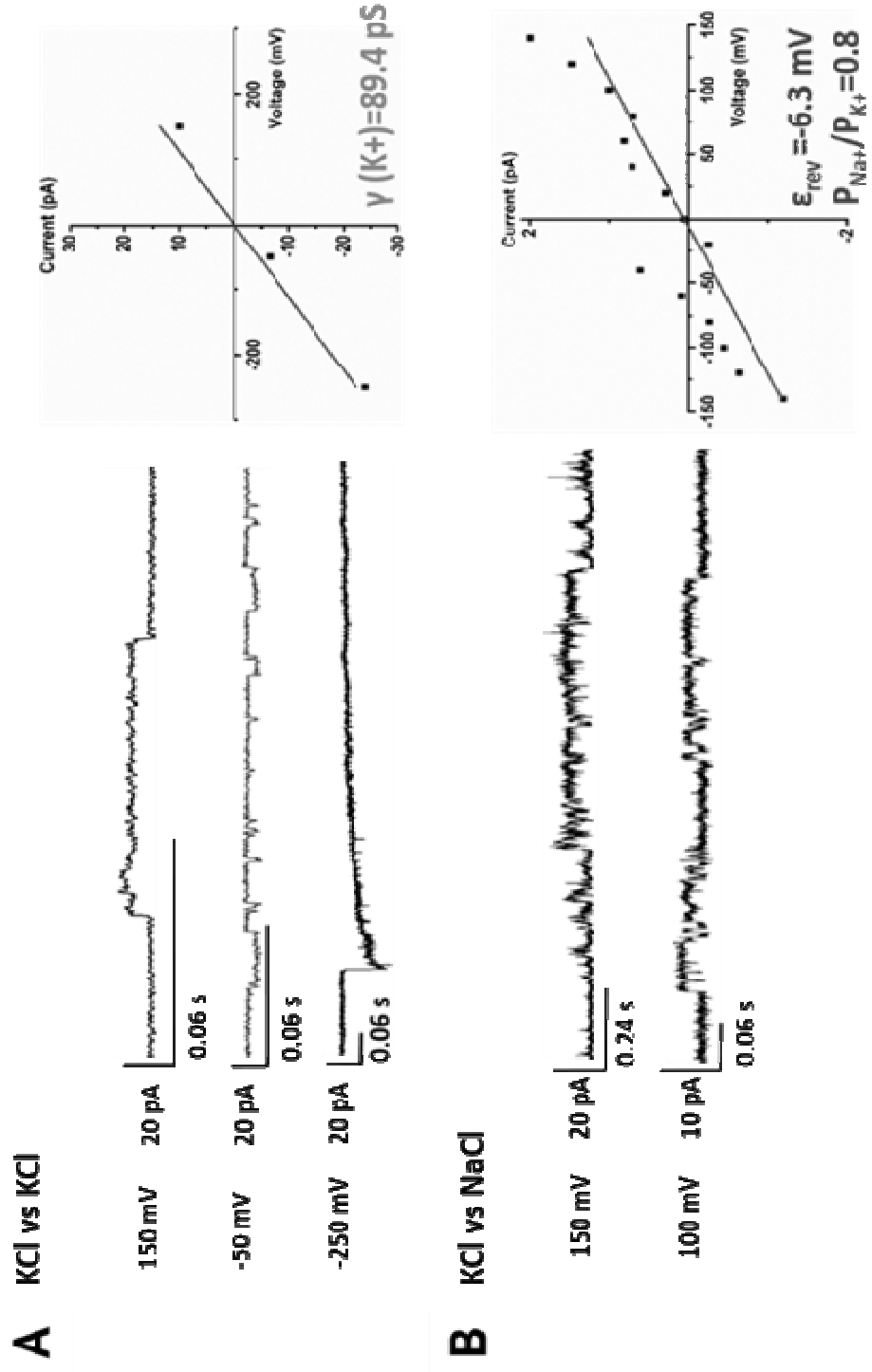

A
KCl vs KCl
150 mV
20 pA
0.06 s
-50 mV
20 pA
0.06 s
-250 mV
20 pA
0.06 s
Current (pA)
Voltage (mV)
γ (K+)=89.4 pS
B
KCl vs NaCl
150 mV
20 pA
0.24 s
100 mV
10 pA
0.06 s
Current (pA)
Voltage (mV)
ε_rev=-6.3 mV
P_Na+/P_K+=0.8

FIG. 20

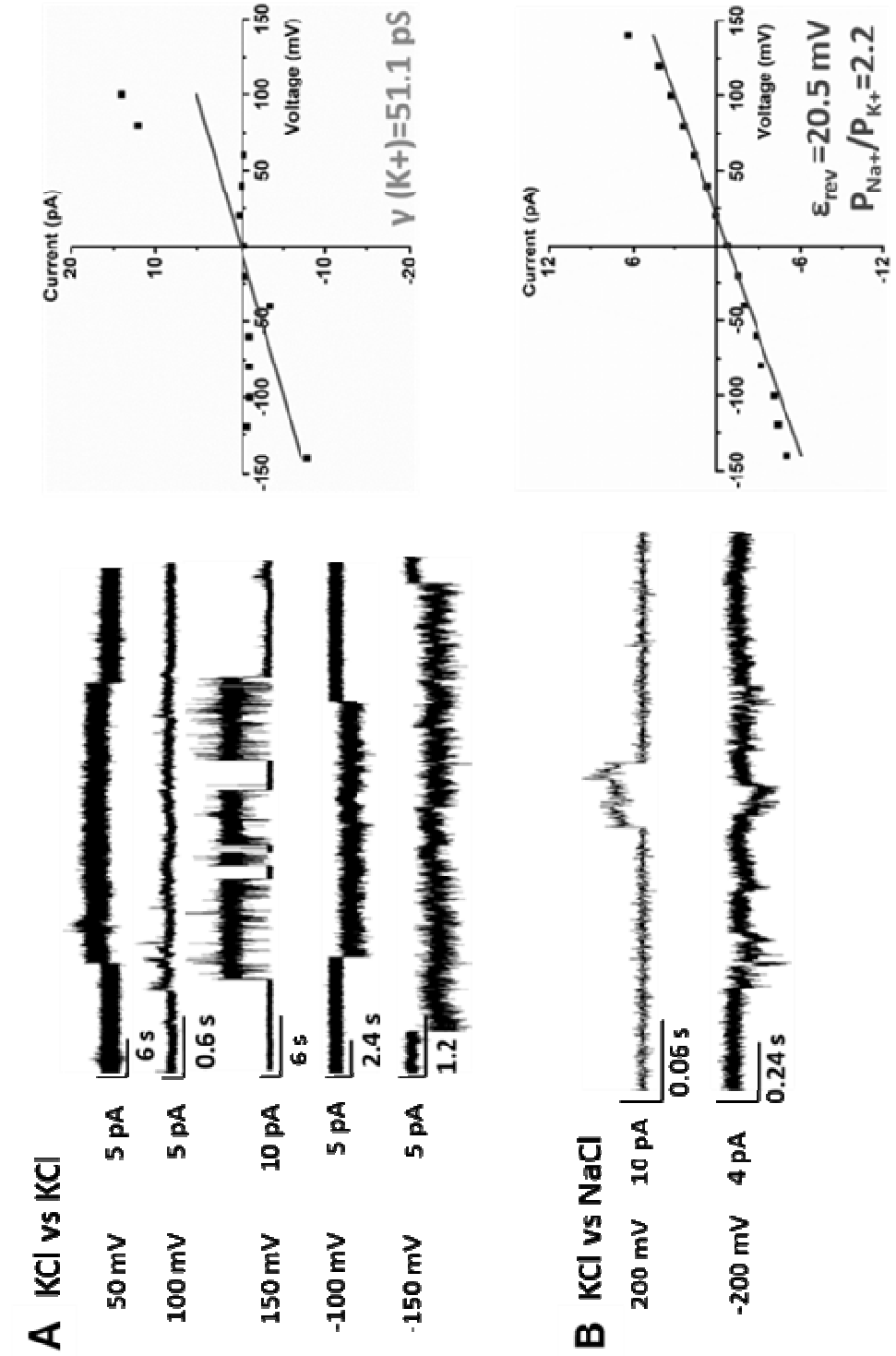

A KCl vs KCl
50 mV
5 pA
6 s
100 mV
5 pA
0.6 s
150 mV
10 pA
6 s
-100 mV
5 pA
2.4 s
-150 mV
5 pA
1.2
Current (pA)
Voltage (mV)
γ (K+)=51.1 pS
B KCl vs NaCl
200 mV
10 pA
0.06 s
-200 mV
4 pA
0.24 s
Current (pA)
Voltage (mV)
ε_{rev} =20.5 mV
P_{Na+}/P_{K+}=2.2

FIG. 21

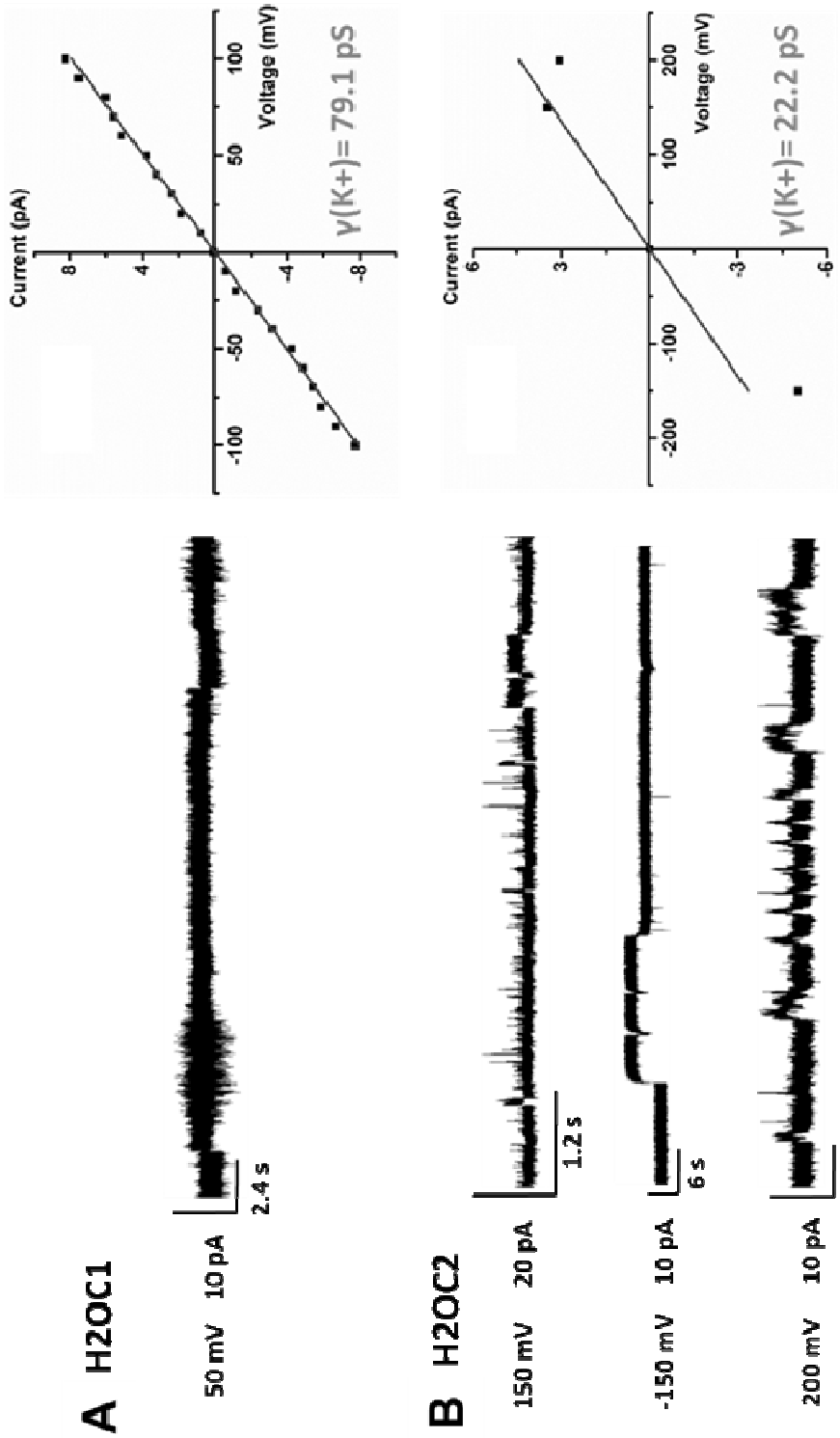

A H2OC1
50 mV
10 pA
2.4 s
Current (pA)
Voltage (mV)
γ(K+)= 79.1 pS
B H2OC2
150 mV
20 pA
1.2 s
-150 mV
10 pA
6 s
200 mV
10 pA
0.6 s
Current (pA)
Voltage (mV)
γ(K+)= 22.2 pS

FIG. 22

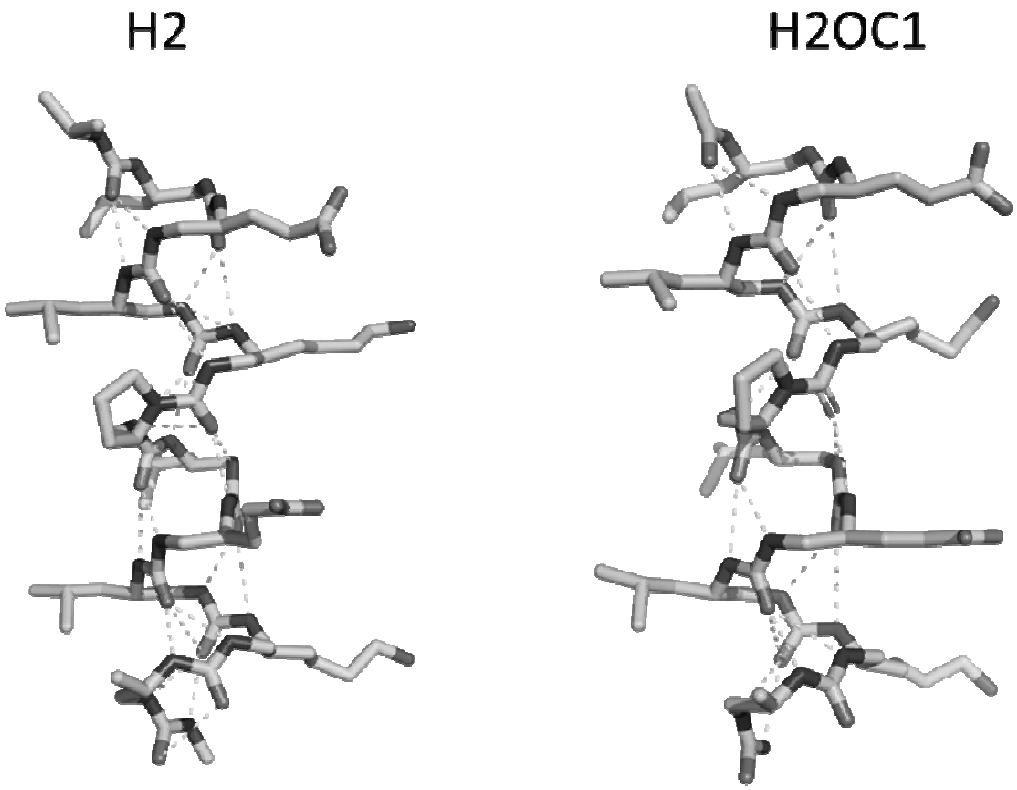
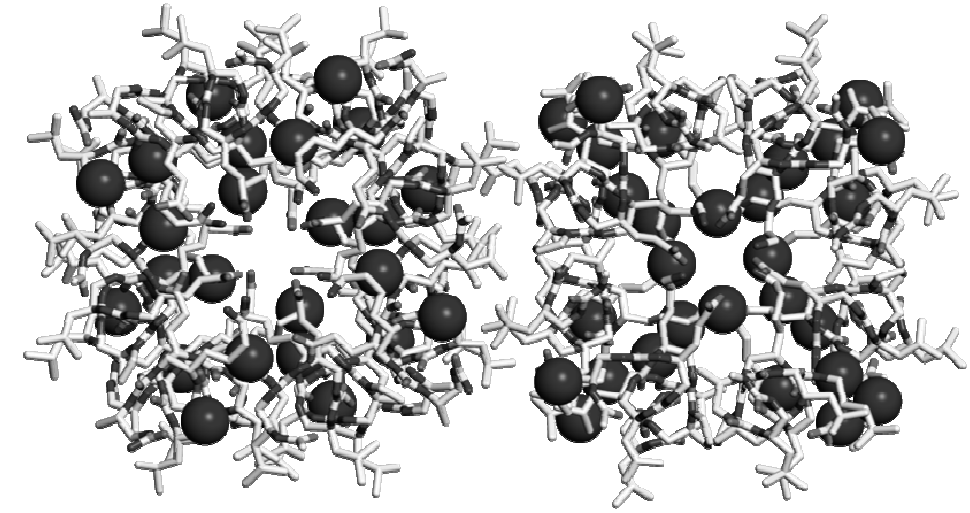
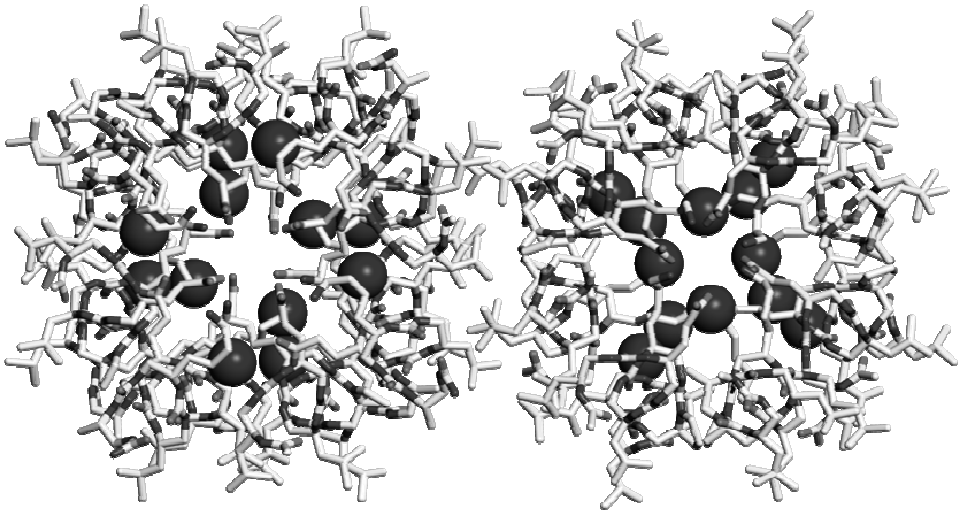


FIG. 23



Crystal structures with all waters displayed



Crystal structures with selected waters only displayed

FIG. 24

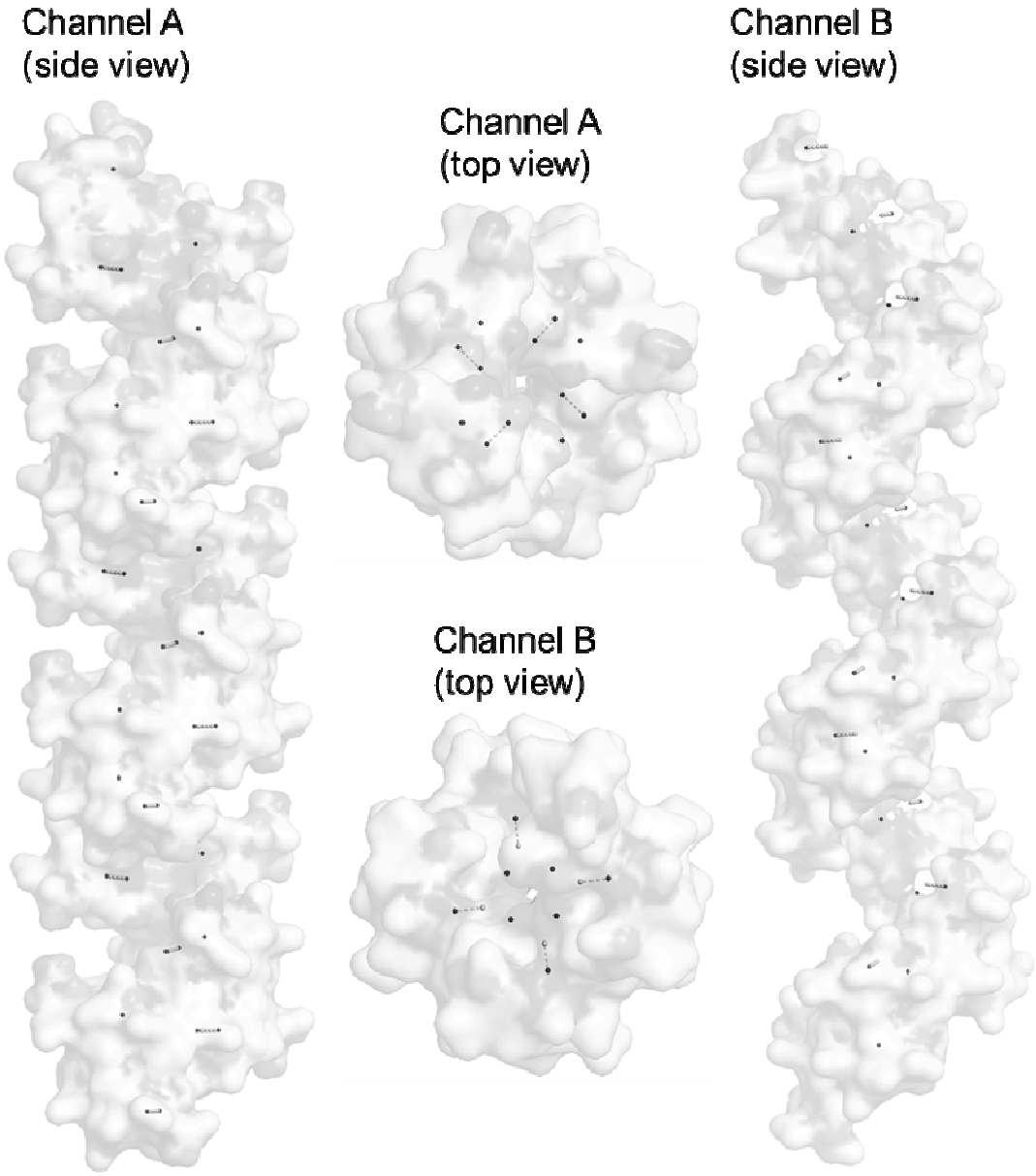

Channel A
(side view)
Channel A
(top view)
Channel B
(side view)
Channel B
(top view)

FIG. 25

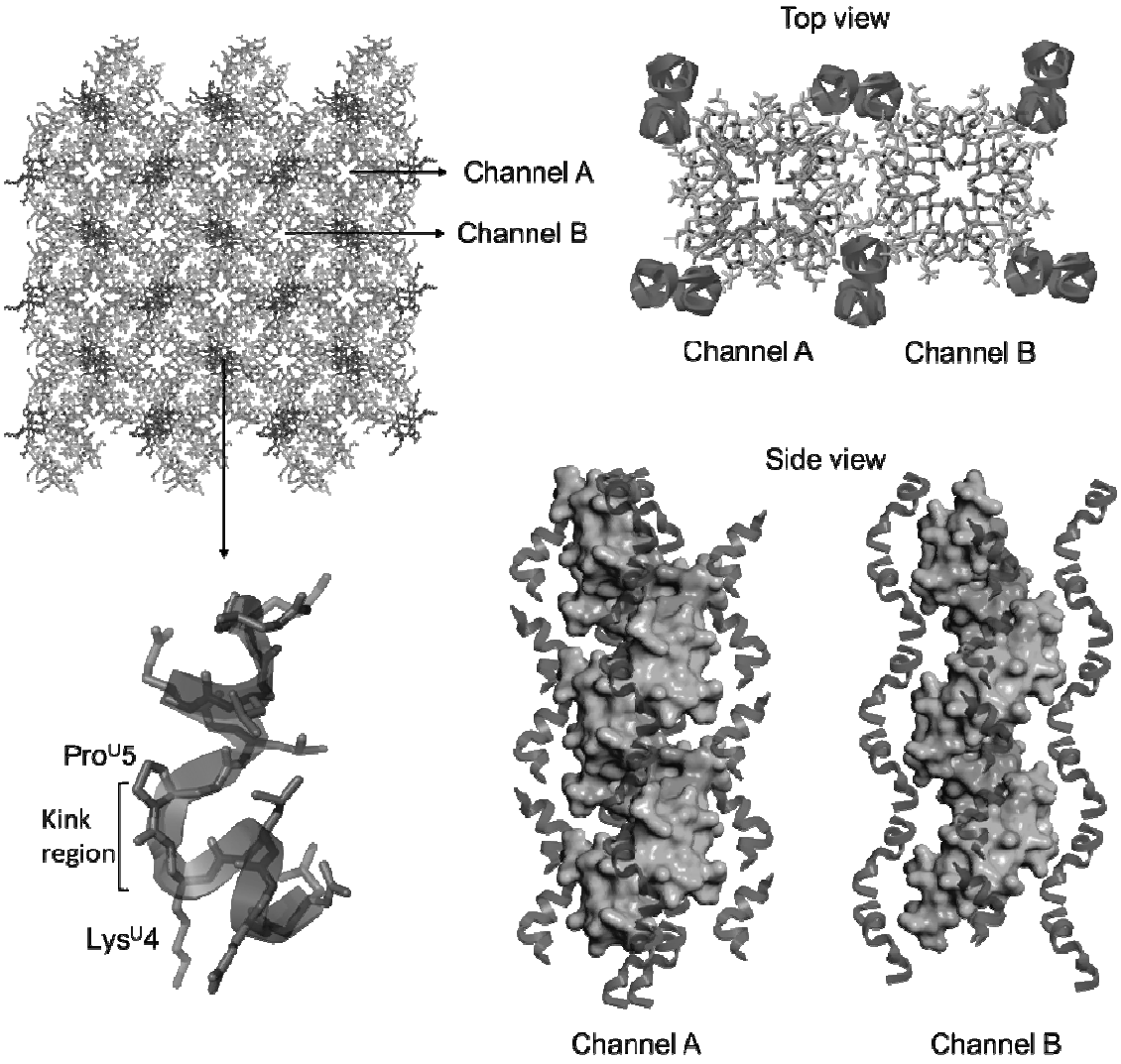

Top view
Channel A
Channel B
Channel A
Channel B
Side view
Pro^{U}5
Kink region
Lys^{U}4
Channel A
Channel B

FIG. 26

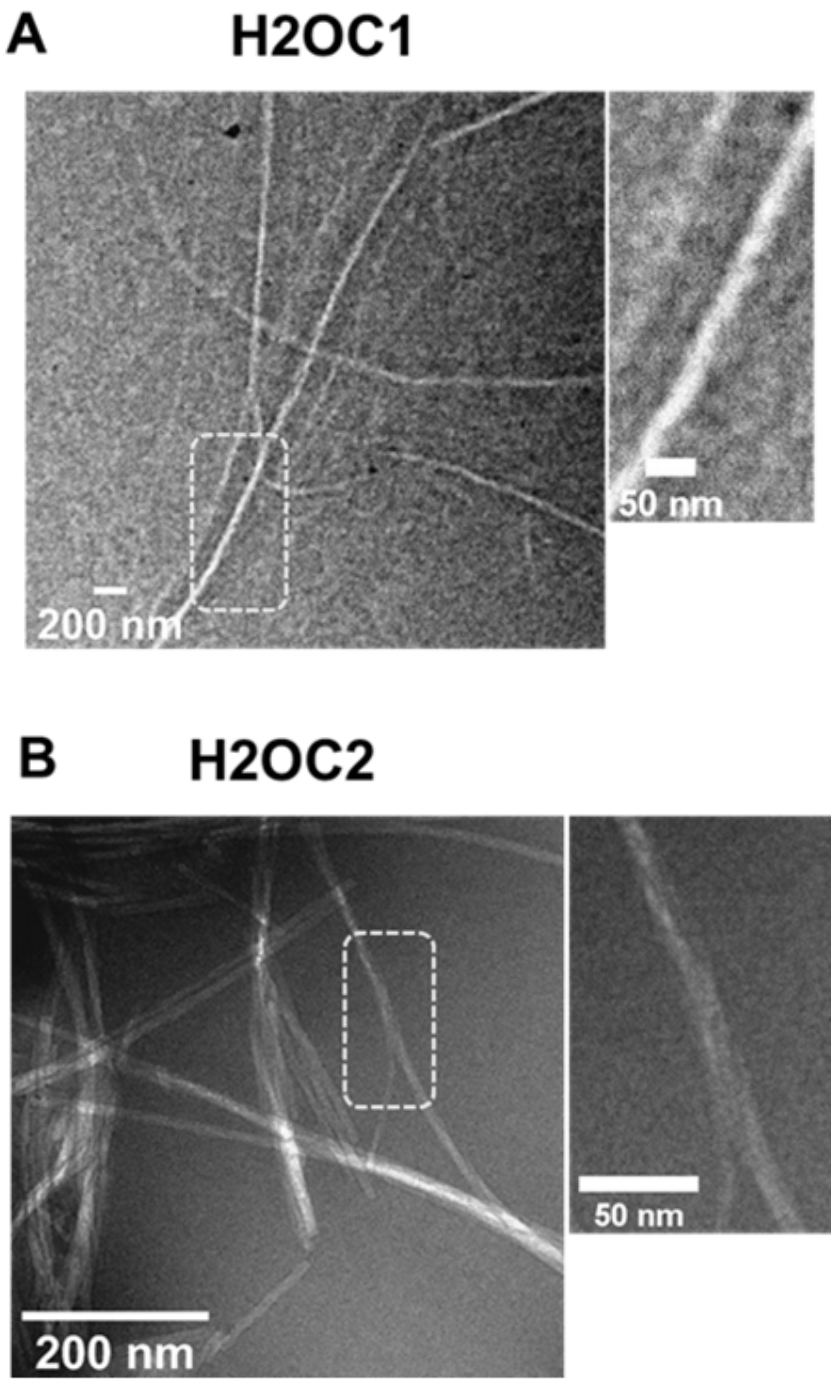


FIG. 27

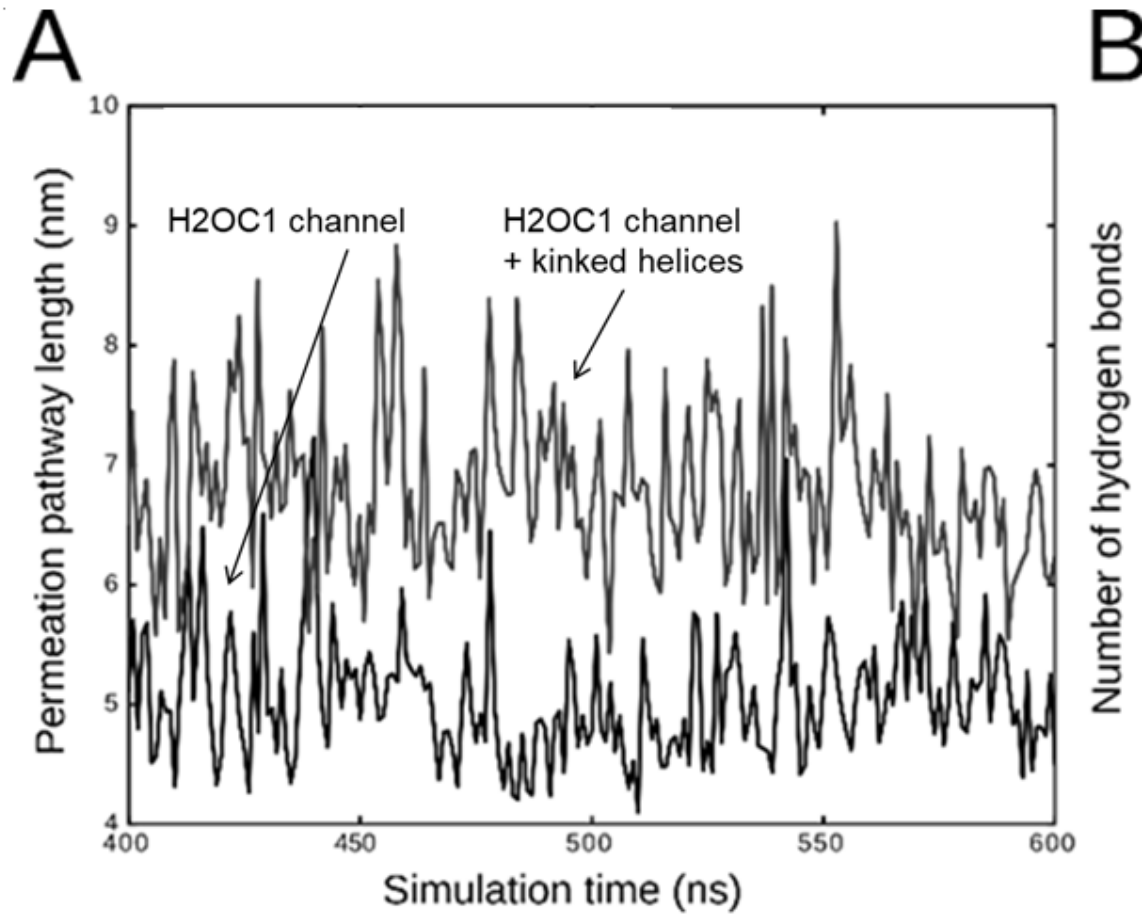

A
B
H2OC1 channel
H2OC1 channel
+ kinked helices
Permeation pathway length (nm)
Number of hydrogen bonds
Simulation time (ns)
10
9
8
7
6
5
4
400
450
500
550
600

FIG. 27 continued

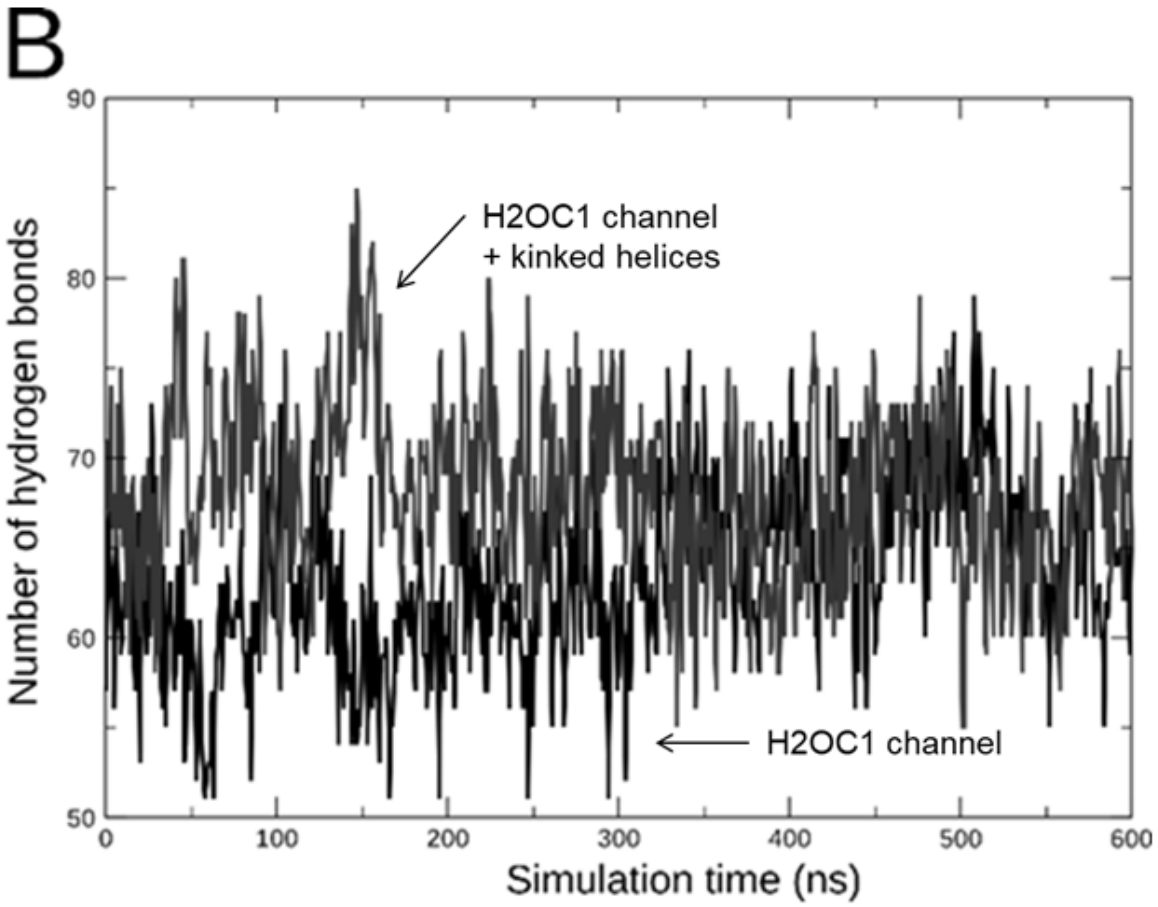


FIG. 28 [Scheme S1]

