

Supporting information for: *Cyclodextrin Ion Channels*

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Voltage Clamp Data Acquisition

A model BC-525A bilayer clamp (Warner Instrument Corp.) was used for planar bilayer experiments. The analogue output was filtered with an 8-pole Bessel filter (Frequency Devices, model 902) and digitized with a 330 kHz digitizer (Axon Instruments, Digidata 1200A). Data acquisition was controlled by the pClamp8 software package (Axon Instruments). Data were collected at 10 Hz, analogue filtered at 1 Hz, and digitally filtered at 50 Hz. The headstage and the bilayer chamber (3 mL polystyrene cuvette with 250 μm diameter aperture held in a 5 mL PVC holder) were placed on a floating table and electrically shielded by a grounded aluminum Faraday cage. Agar salt bridges (2 M KNO_3 in 1% Agar) were used to stabilize junction potentials and were employed between the electrolyte in each well of the cell and Ag/AgCl electrodes. Electrolyte solutions were prepared from high purity salts and nanopure water.

A stock solution of diphytanoyl phosphatidylcholine (diPhyPC) in chloroform (Avanti Polar Lipids; shipped on dry ice) was divided into sealed glass vials under an argon atmosphere and stored at $-12\text{ }^\circ\text{C}$. For use in an experiment, a stream of dry nitrogen was passed through the vial for 1 hour. The dried lipid was diluted with decane to give a solution concentration of 25 mg/mL in lipid.

Bilayers were formed by either brushing or dipping: after lipid in decane had been introduced by brushing, a lipid/ decane film formed on the surface of the electrolyte, and bilayers could then be formed by withdrawal of 2-3 mL of electrolyte from the cell holder by syringe to expose one face of the aperture to the air-water interface held in the cell holder, followed by reintroduction of the electrolyte to oppose monolayers across the aperture in the cuvette. Bilayer quality was monitored via the capacitance and stability under applied potential, using the criteria previously described¹. The measured voltage was applied with respect to the *trans* (cuvette) side of the bilayer, making the *trans* side the relative ground. Digitized data files were analyzed using the pClamp10 suite of programs.

The compounds are introduced to the membrane in two ways, depending on the solvent in which the compound can be dissolved:

Direct injection - all injection experiments utilized bilayers that were apparently stable at 100 mV for periods of 20 minutes or more. Aliquots (1-5 μL of transporter solutions in MeOH) were injected with a microliter syringe as close as possible to the bilayer in the free well of the cuvette holder (*cis* side), and gently stirred with a stream of nitrogen for 5 minutes.

Pre-mixed into lipid - in this method, 1mol% of compound (in CDCl_3 or MeOH-d_4) was added to the diPhyPC/ CHCl_3 solution, and solvent removed with a stream of N_2 , and bilayer membrane prepared by brushing/dipping as described above. Most of the bilayers formed with this method gave bilayers with good quality.

Of the two methods, direct injection is preferable, as it allows monitoring of pristine bilayer prior to compound introduction. Following direct injection, channel behaviour typically appears within 20

minutes of compound introduction, and persists over period of hours. Once stabilized, continuous data acquisition of at least 30-60 minutes is required to provide sufficient statistical power for the power-law analysis; shorter acquisition periods (10 minutes) are sufficient to characterize other types of behaviors.

Power Law Fitting Procedure

Fitting experimental data to a power law requires two distinct steps. The first step transforms the irregular current trace into a list of opening times; this list is then fitted to a power law distribution.

Event List Generation Manipulation of the digitally filtered traces was carried out using Clampfit 10 of the pClamp suite. A customized threshold search was used to generate the list of events. The threshold was set across the fluctuating section of the trace to maximize the number of events. Within that segment, α is insensitive to the choice of threshold. A minimum duration was fixed at 50ms. The threshold search automatically logs *event start* and *event end* from which the duration can be calculated. The resultant values were exported to the fitting program.

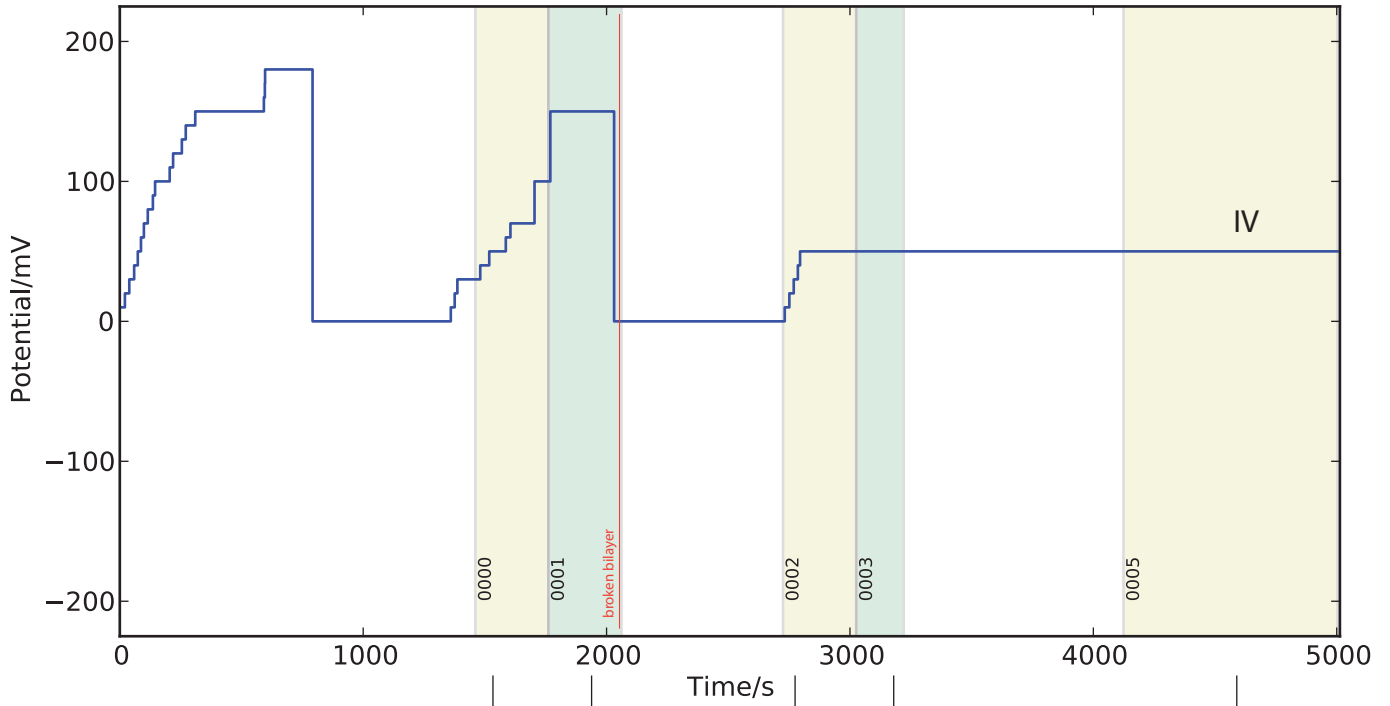
Power Law Fitting The list of opening durations, obtained above as a plain-text file, can then be fitted using the method of Clauset *et al*², implemented in python³. The code performs the Maximum Likelihood Estimate fit, and provides α , x_{\min} , n , and p-value as outputs.

Summary of bilayer activity

Annotated activity grids, as well as full conductance records (and expansions where appropriate), are provided below for every compound studied. The activity grids were prepared as previously described⁴. The summaries are arranged first by compound, then individual experiments. Within each experiment, the first page(s) summarizes the experimental conditions as well as activity grids charted; subsequent pages shows the full conductance record as the top panel, with expansions indicated by corresponding letters.

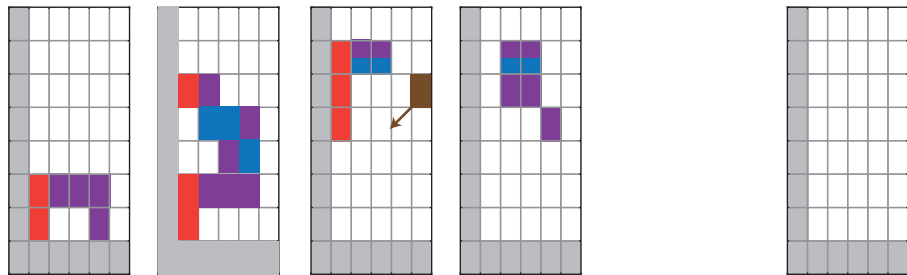
1. Fyles, T. M.; Knoy, R.; Müllen, K.; Sieffert, M., Membrane activity of isophthalic acid derivatives: ion channel formation by a low molecular weight compound. *Langmuir* **2001**, *17*, 6669-6674.
2. Clauset, A.; Shalizi, C. R.; Newman, M. E. J., Power-law distributions in empirical data. *SIAM Rev.* **2009**, *51*, 661-703.
3. Ginsberg, A. <<http://code.google.com/p/aqpy/wiki/PowerLaw>> (accessed November 7).
4. (a) Chui, J. K. W. A New Paradigm for Voltage-Clamp Studies of Synthetic Ion Channels. University of Victoria, Victoria, 2011; (b) Chui, J. K. W.; Fyles, T. M.; Luong, H., Planar bilayer activities of linear oligoester bolaamphiphiles. *Beilstein J. Org. Chem.* **2011**, *7*, 1562-1569.

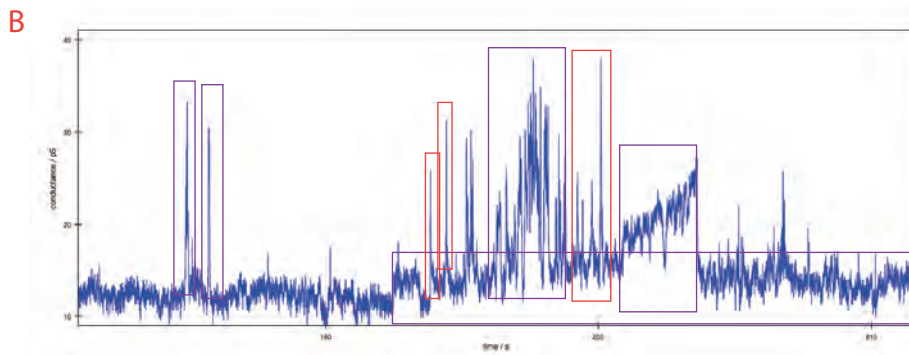
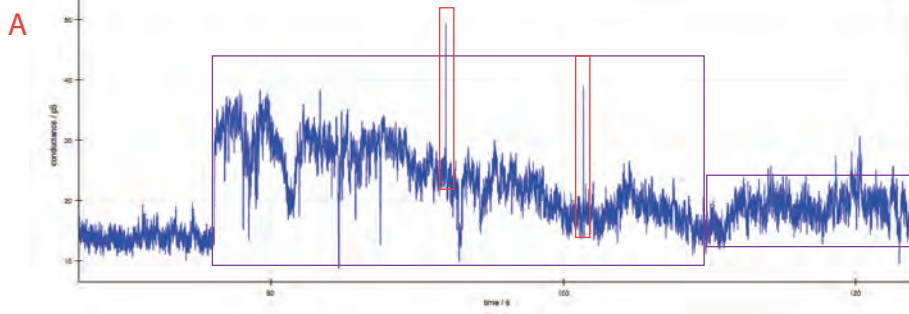
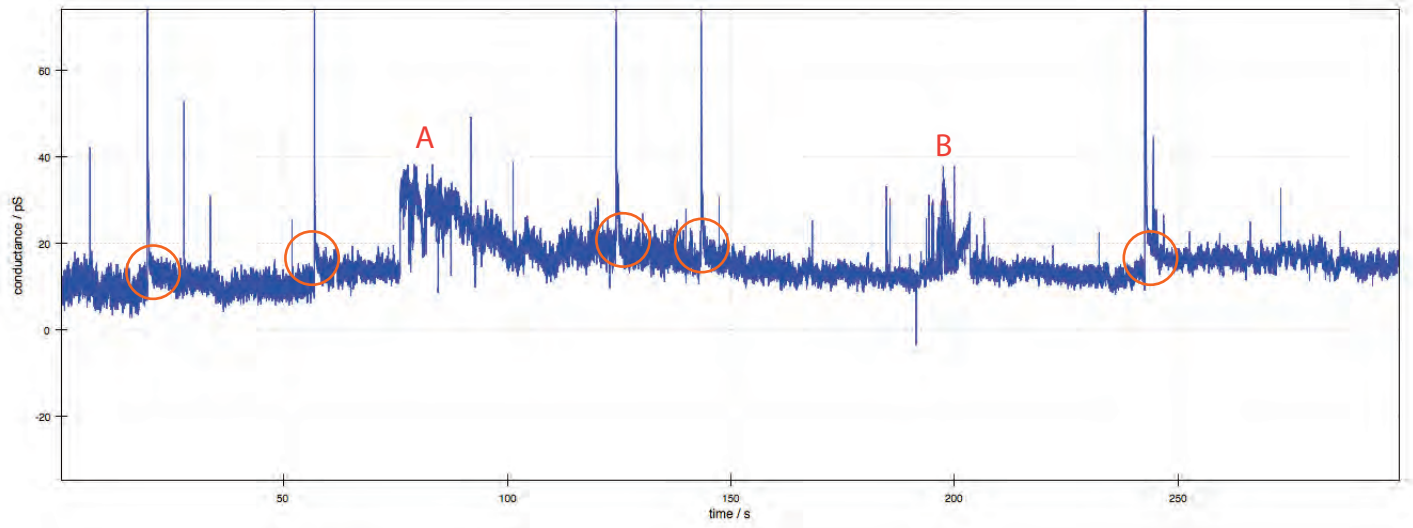
[JC-62] bCD-6E4 - 1M CsCl HEPES pH 7

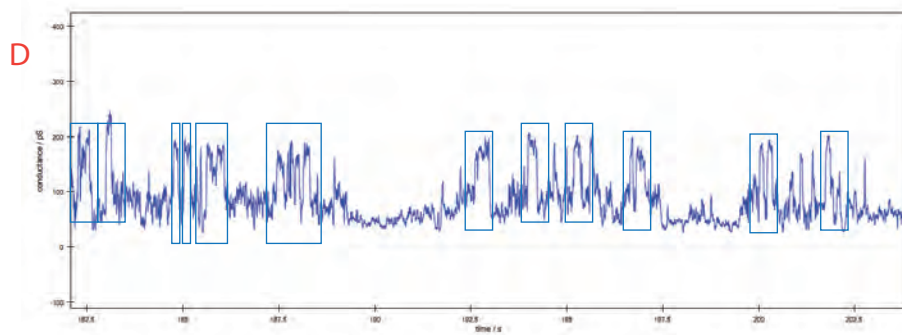
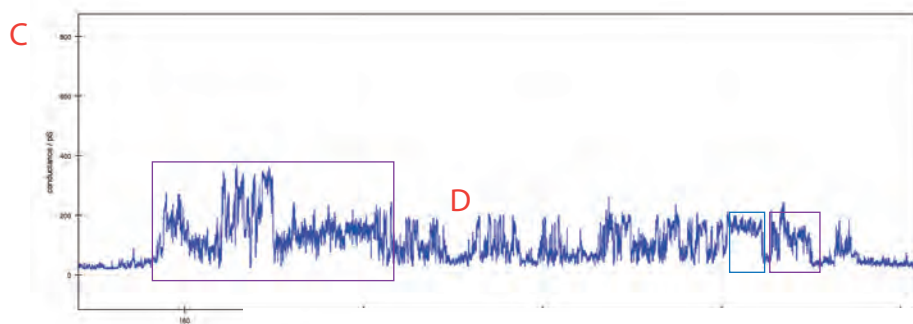
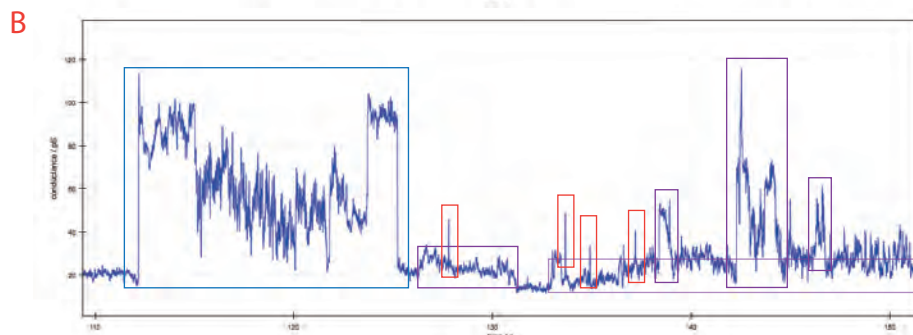
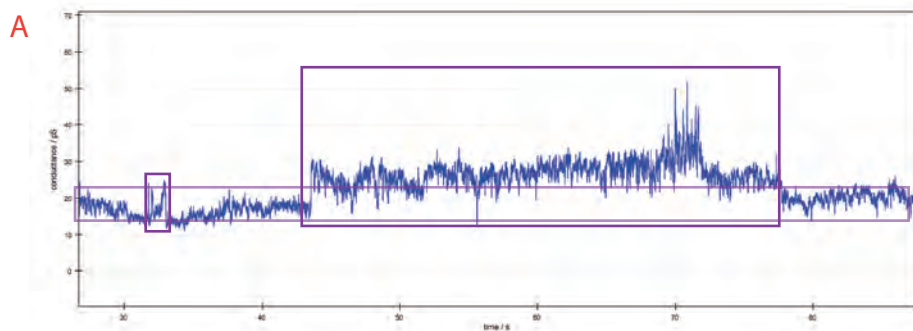
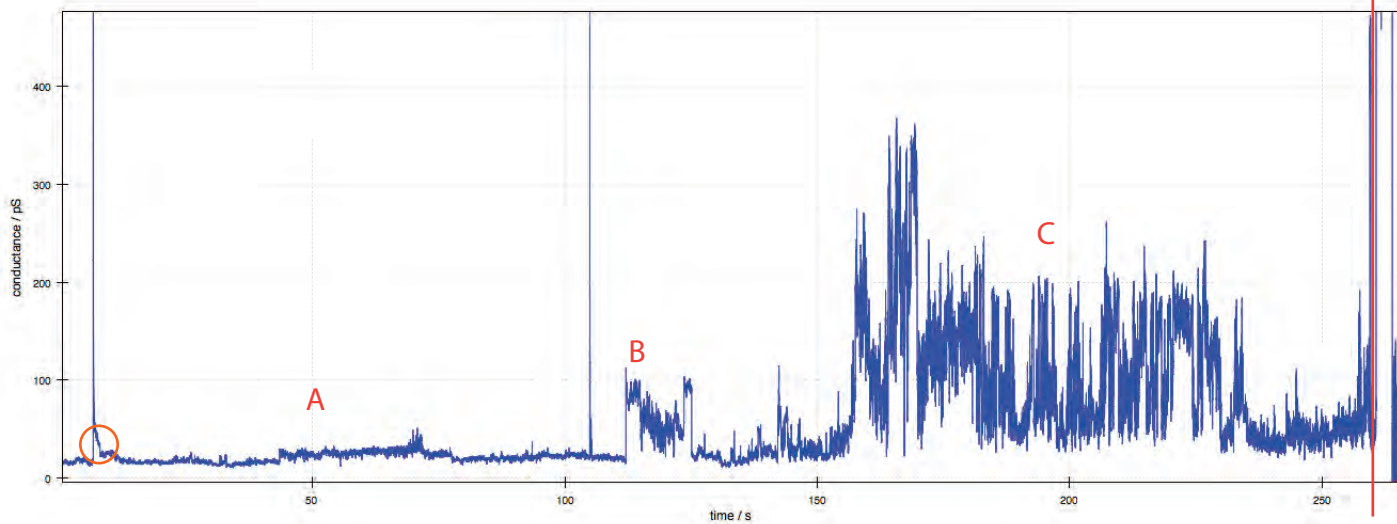


lipid
electrolyte 10uM
contact injection
brush transfer

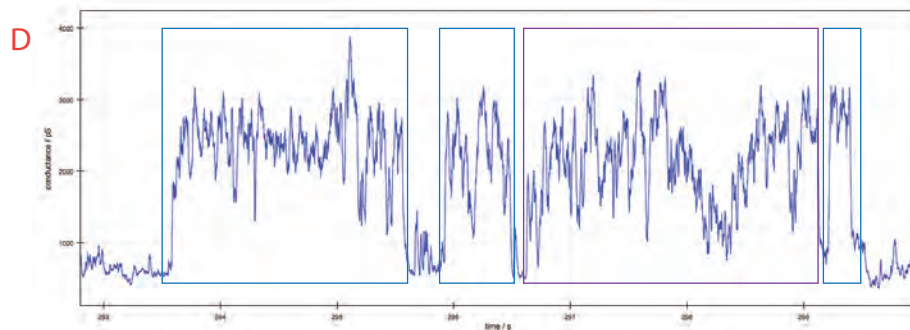
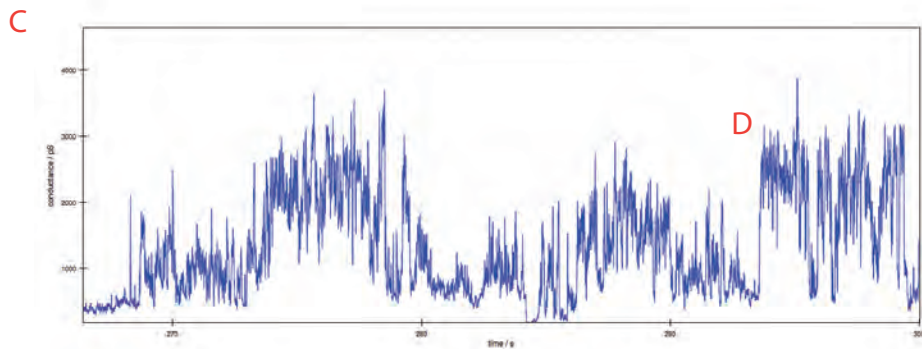
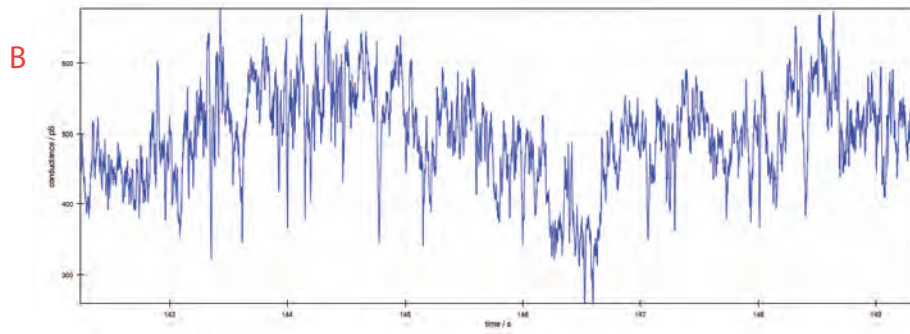
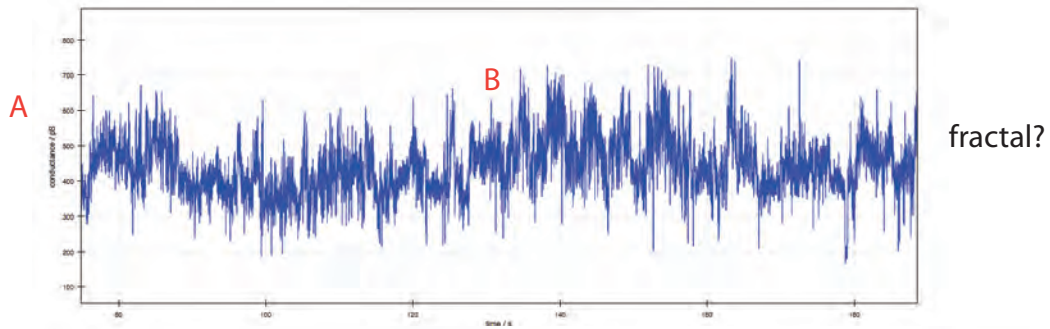
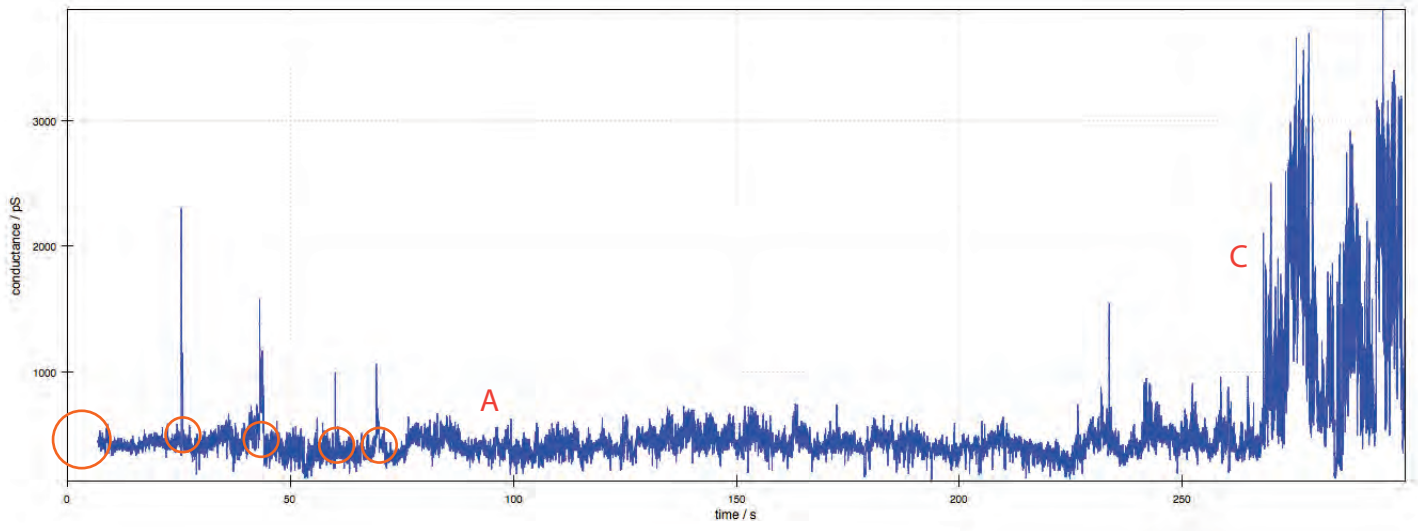
30uM



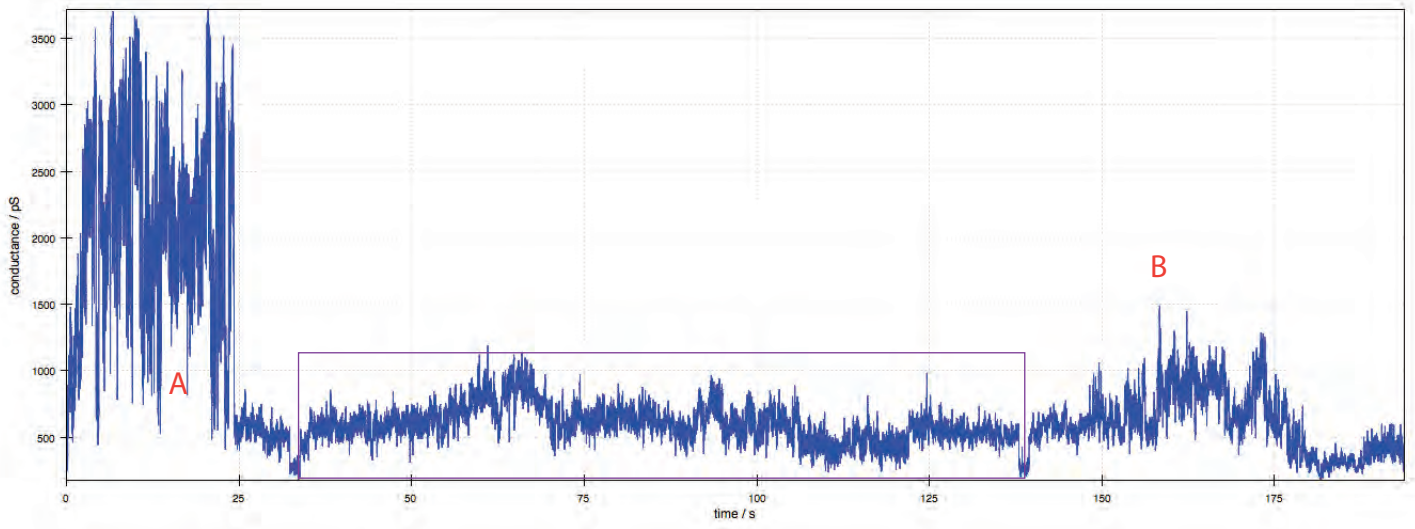




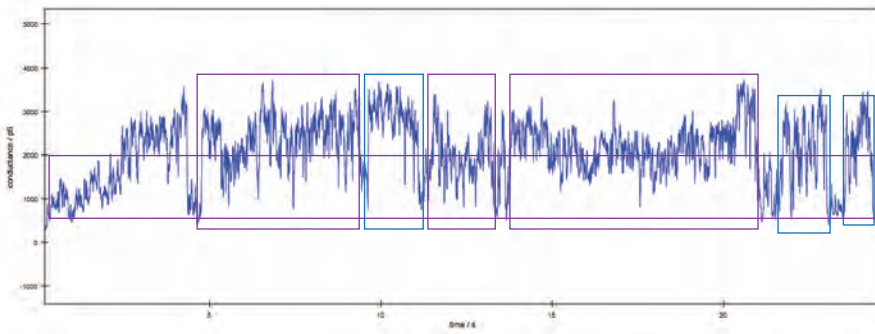
blue, or yellow?



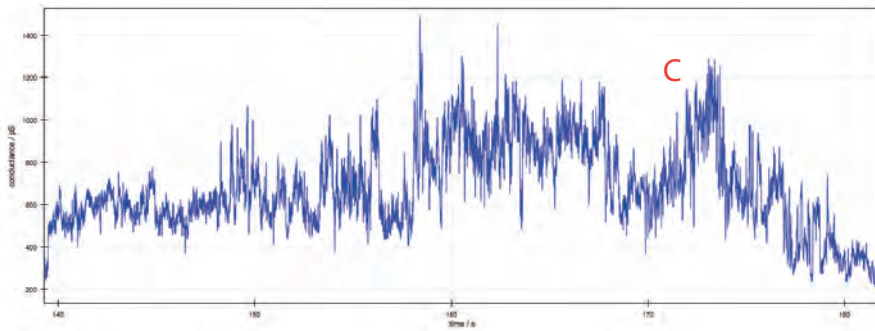
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A

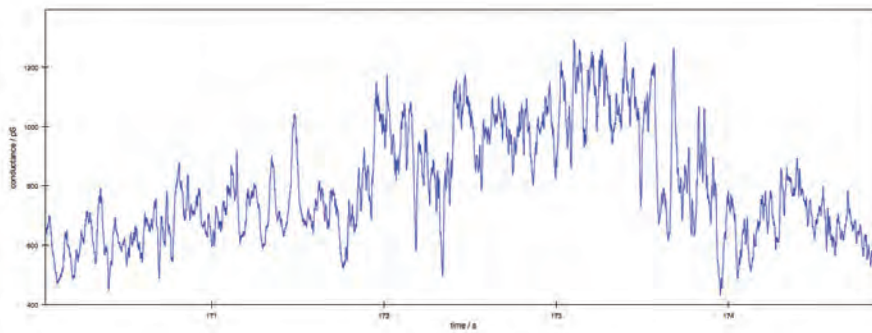


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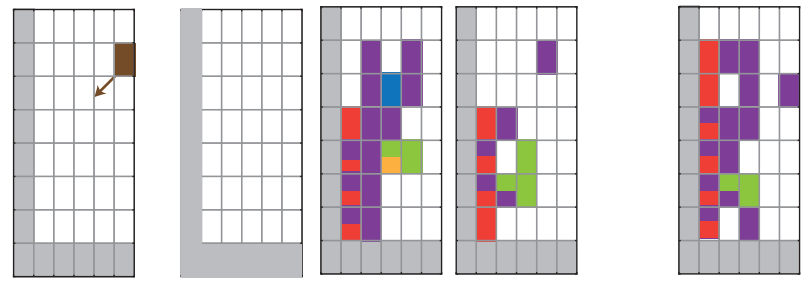
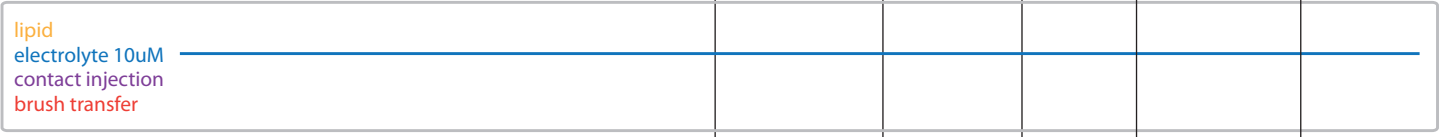
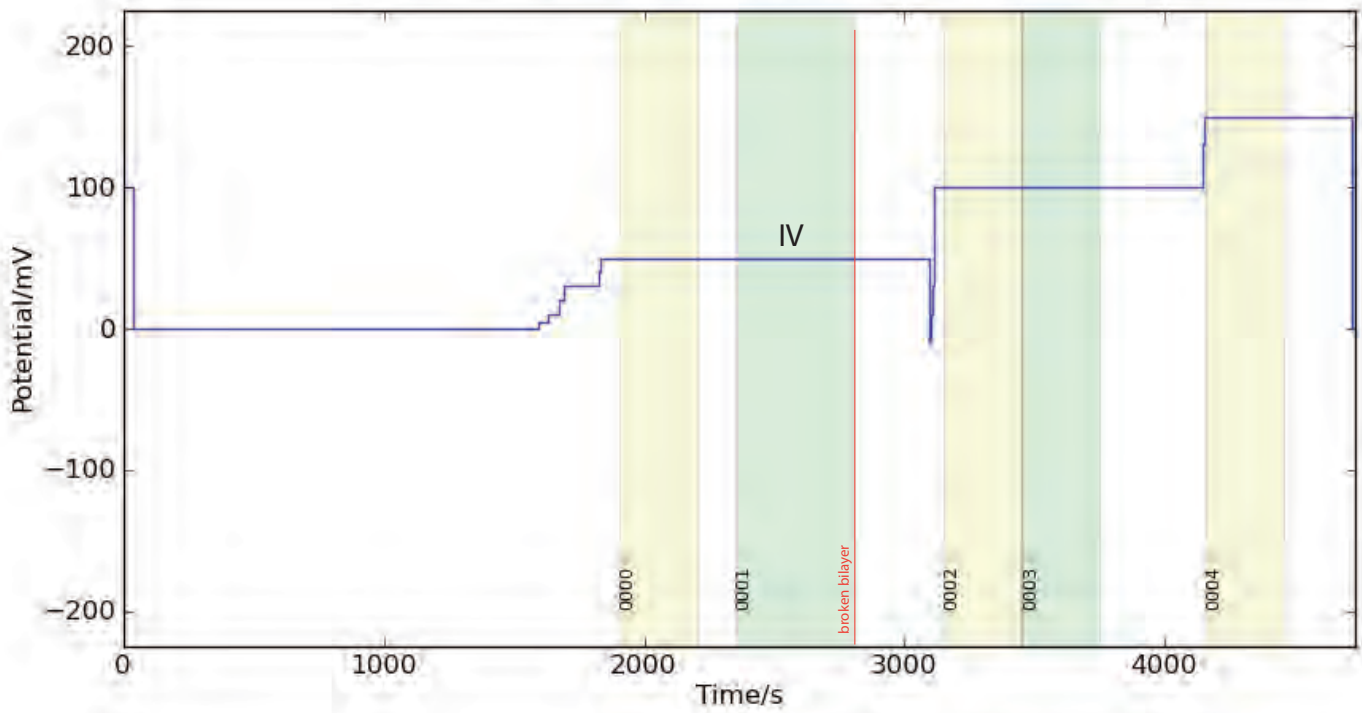


fractal?

C

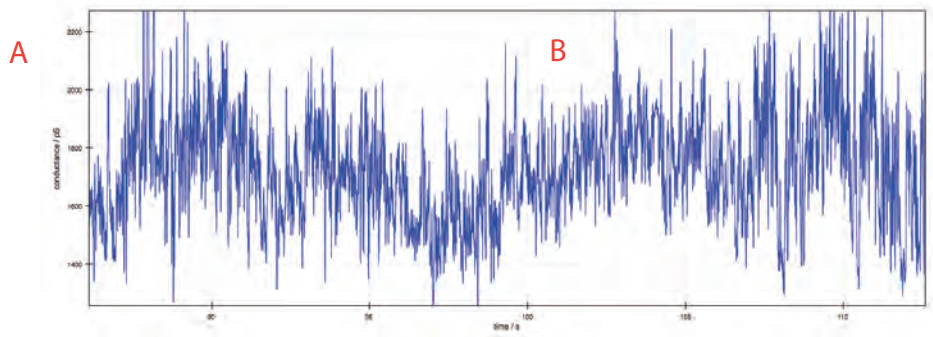
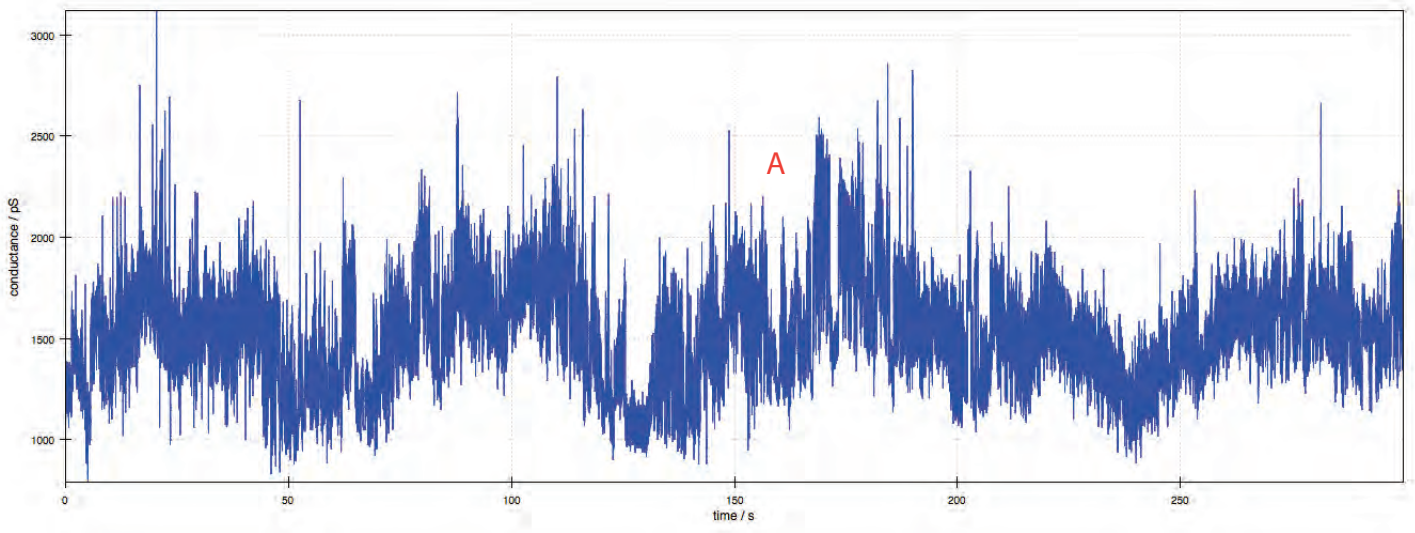


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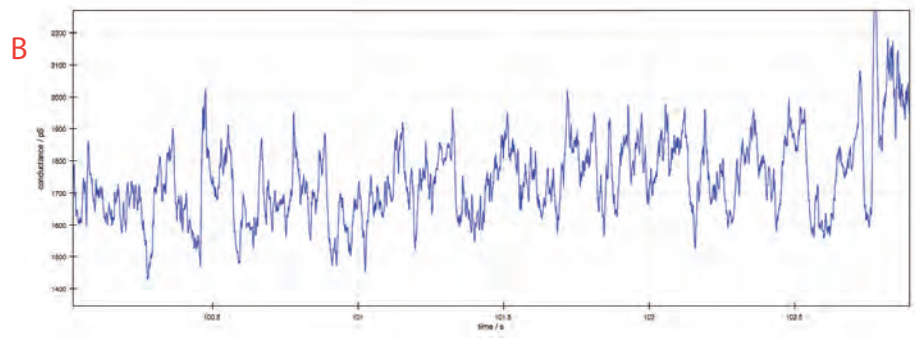


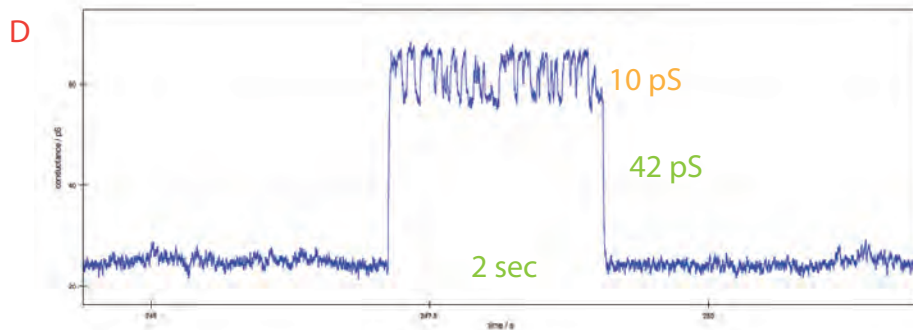
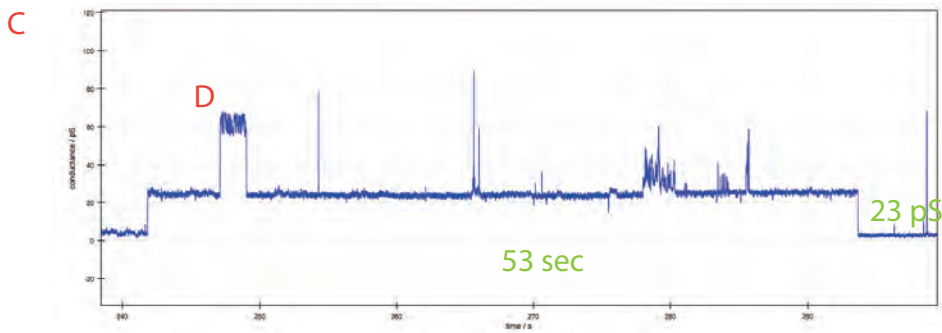
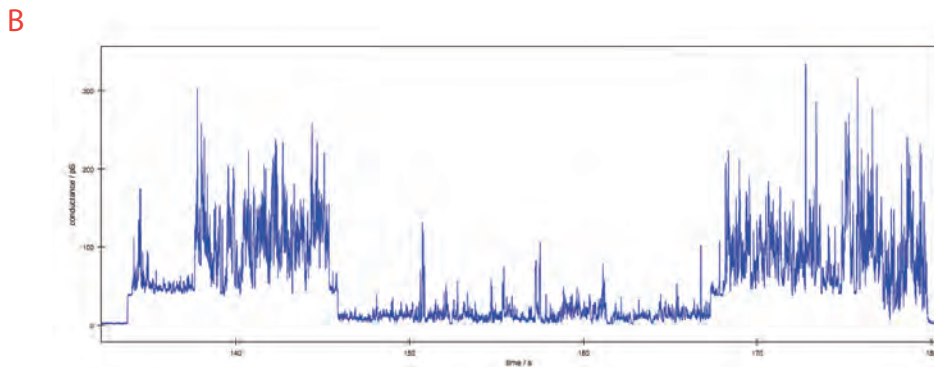
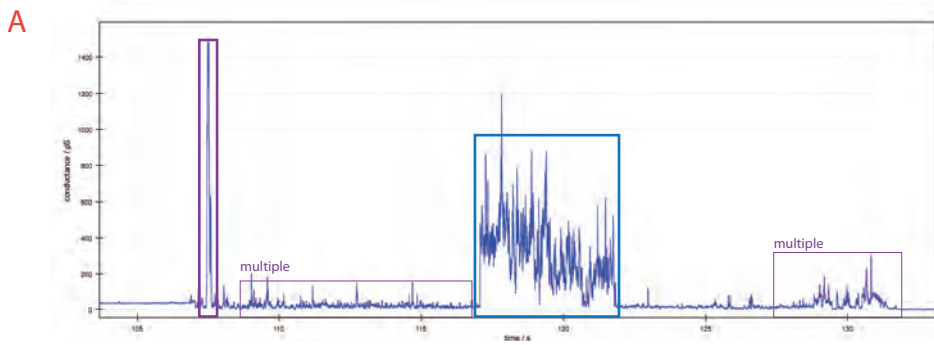
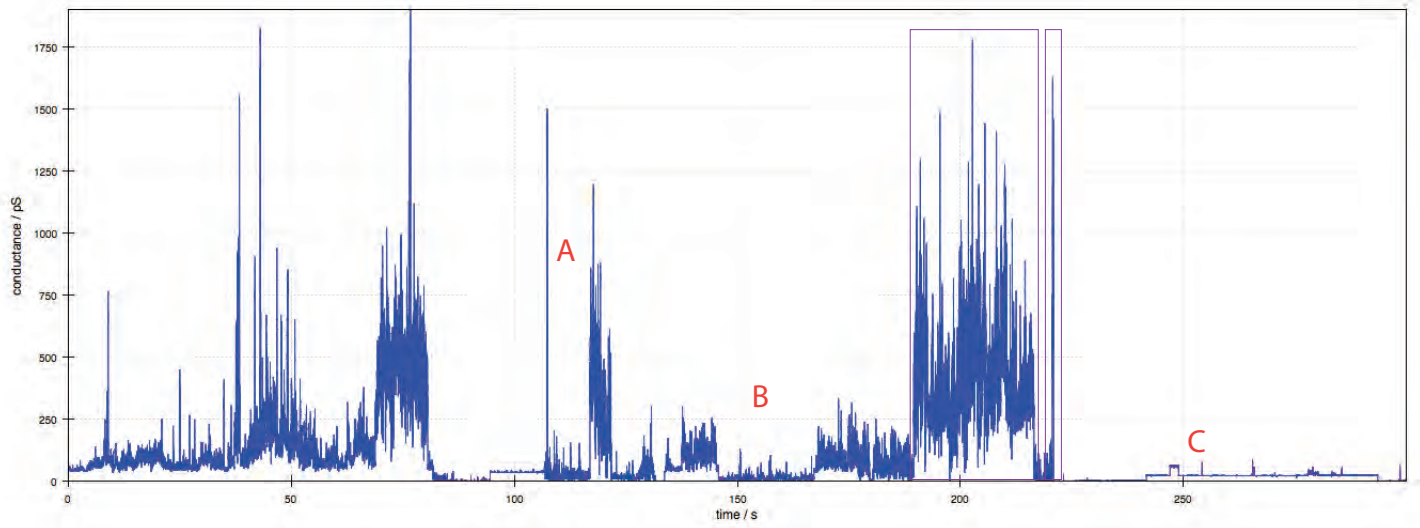
-45->45mV
5mV steps

62b-0000

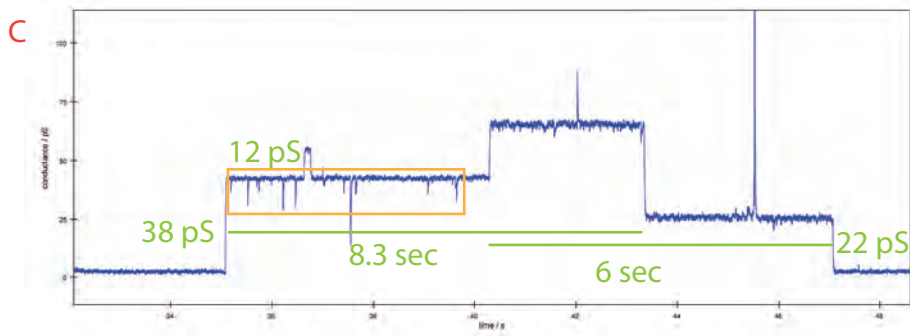
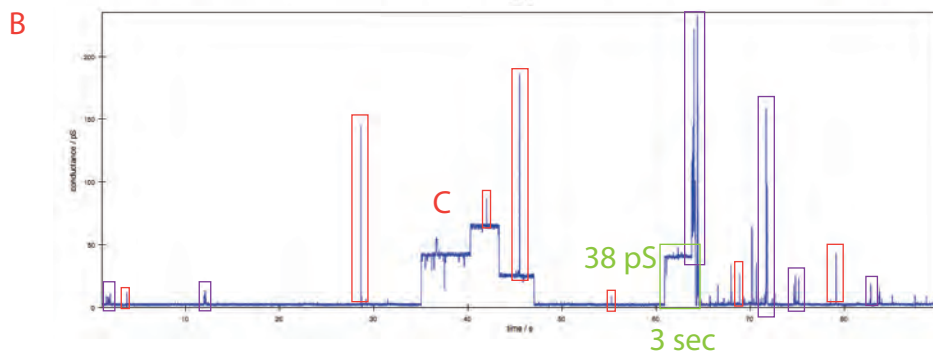
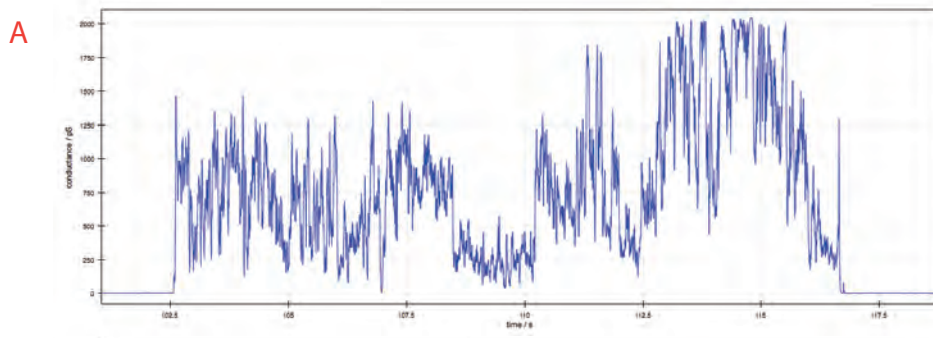
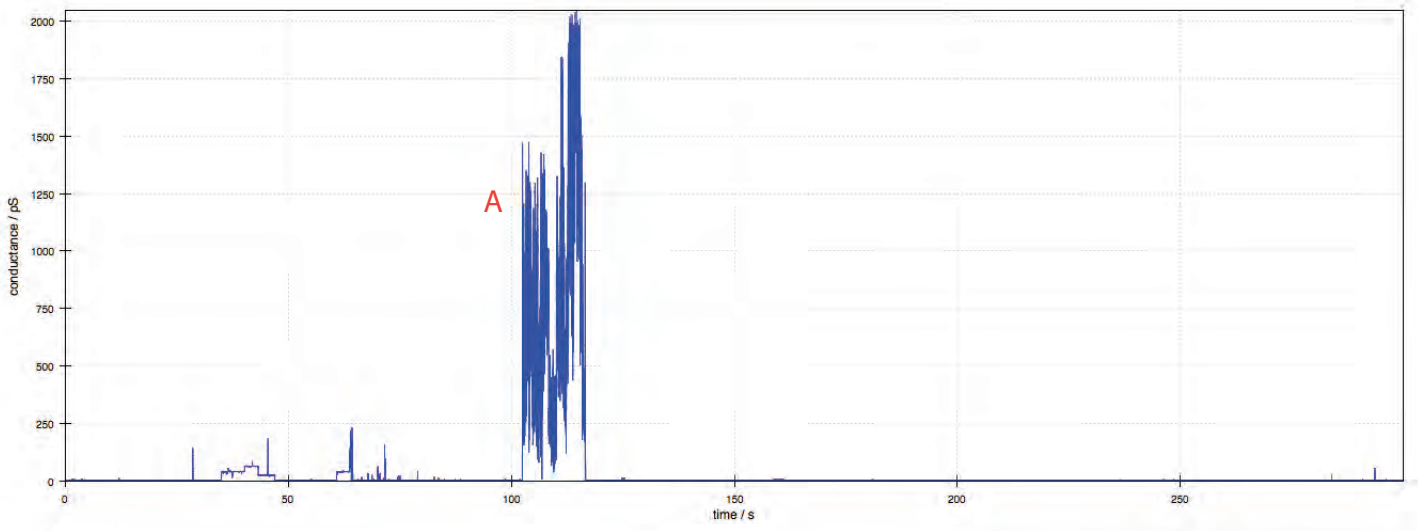


fractal?

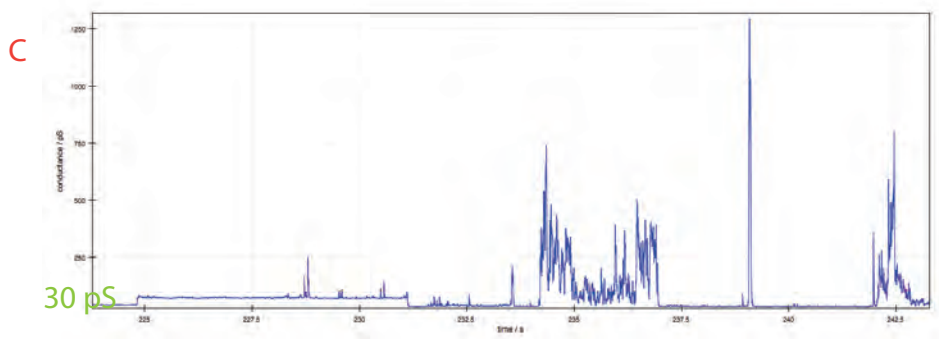
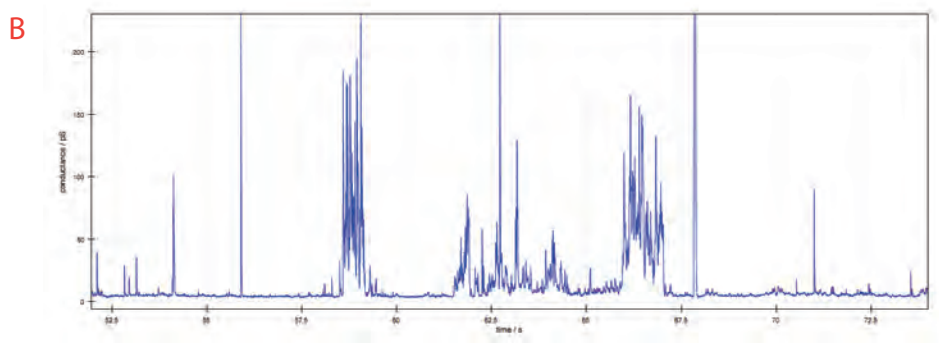
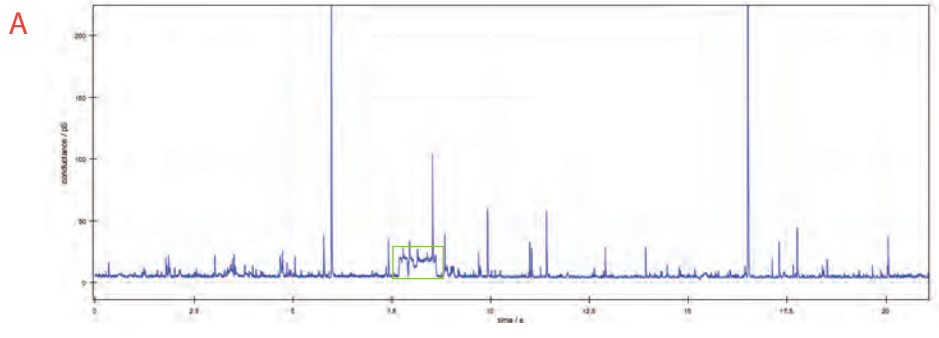
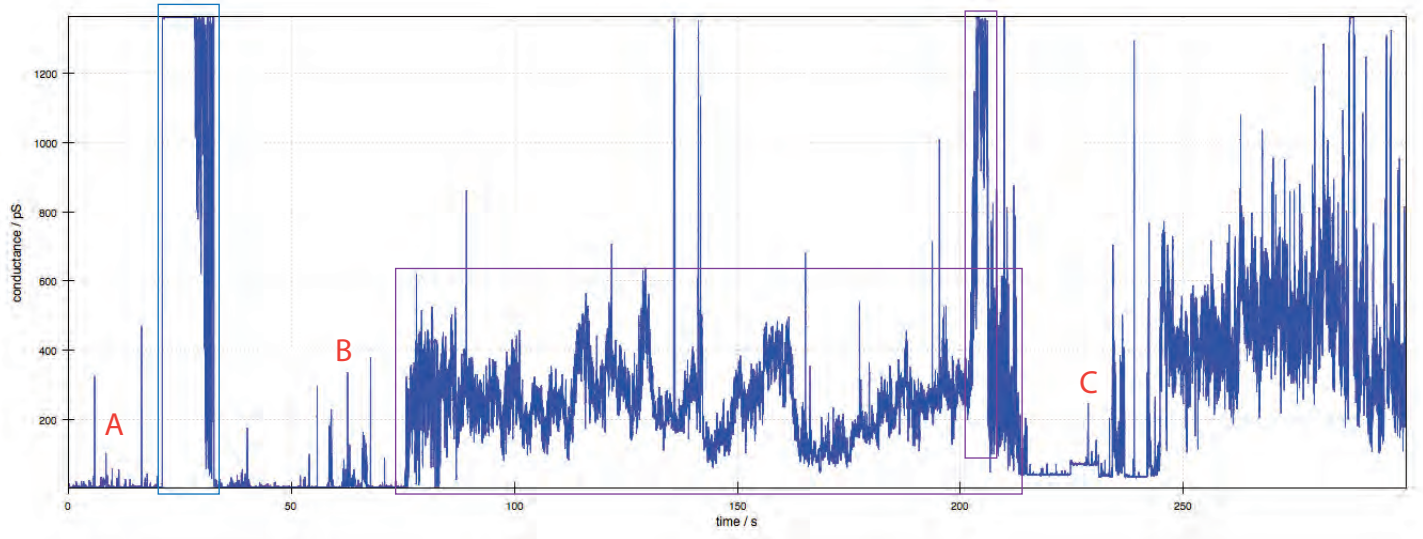




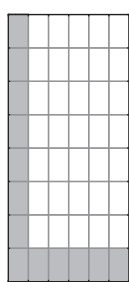
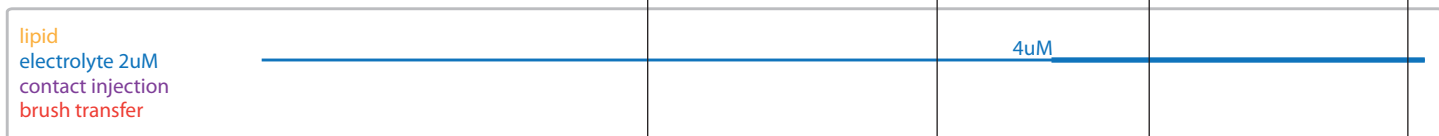
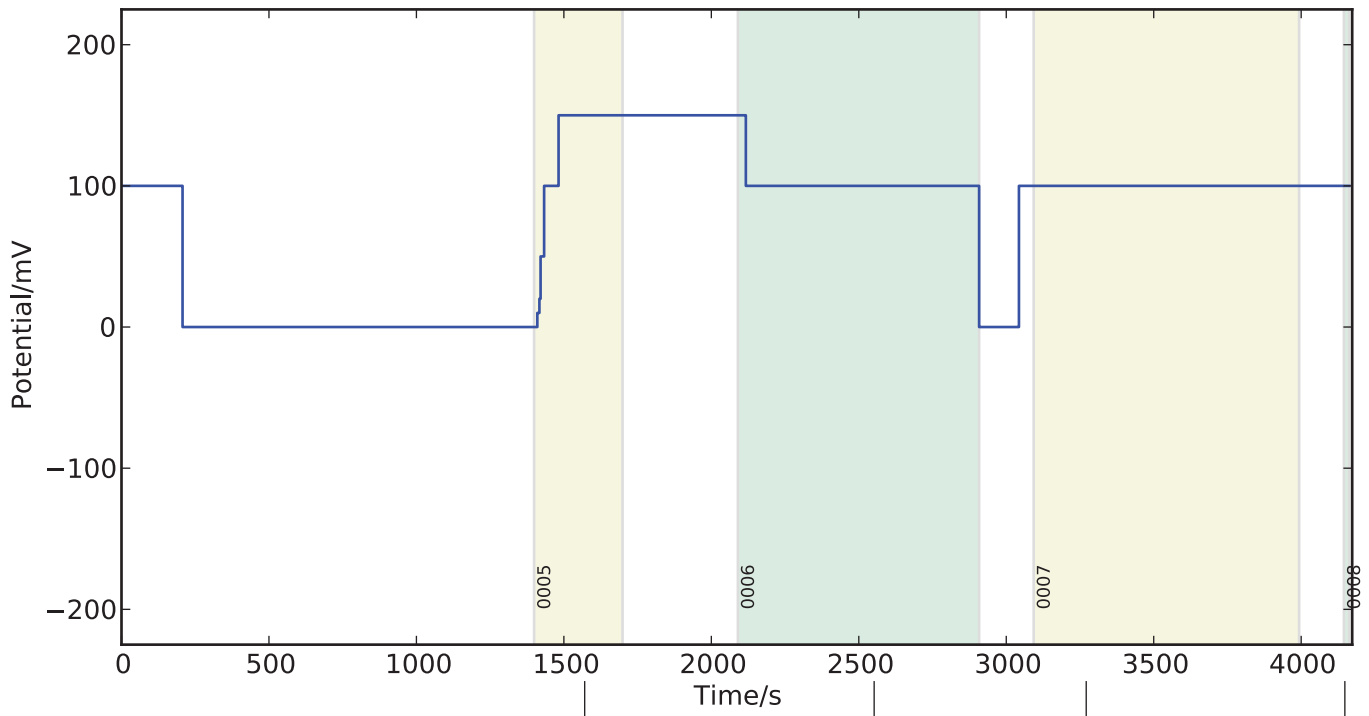
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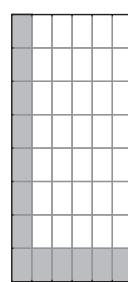
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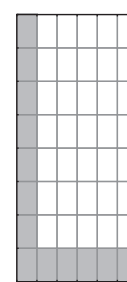
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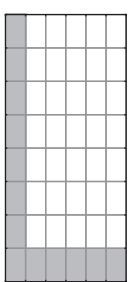
no activity



no activity

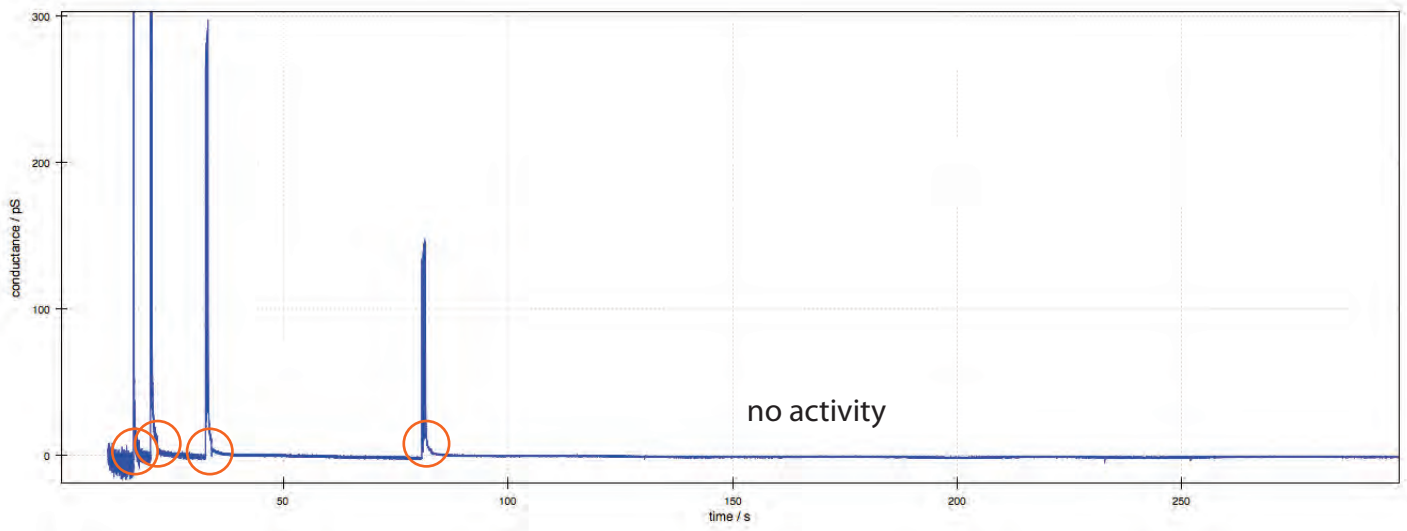


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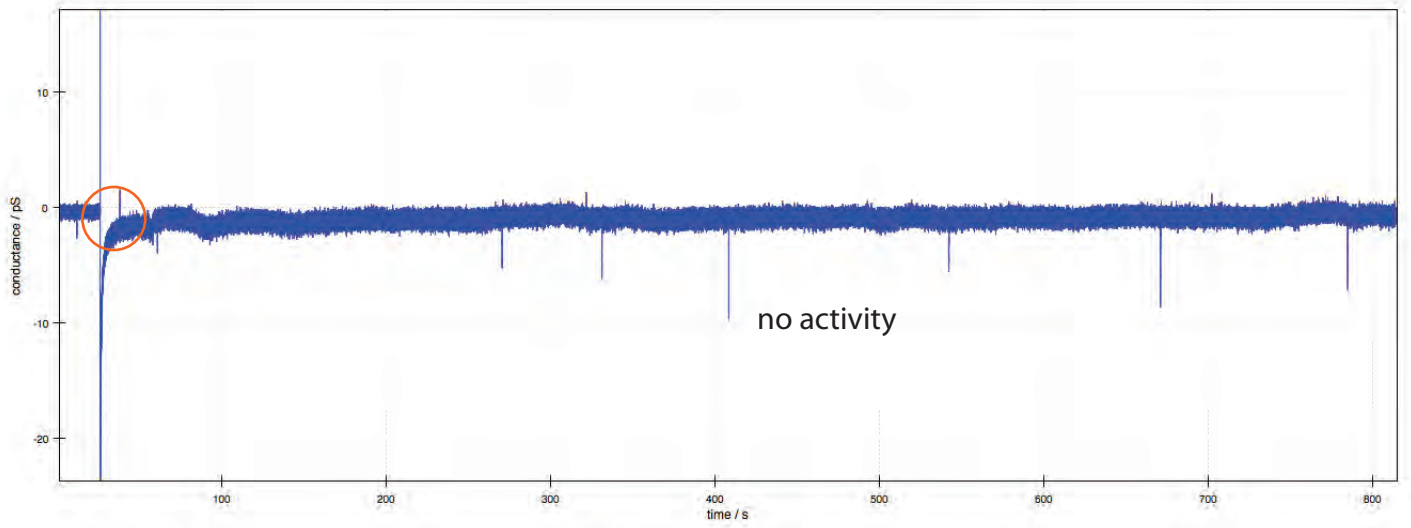


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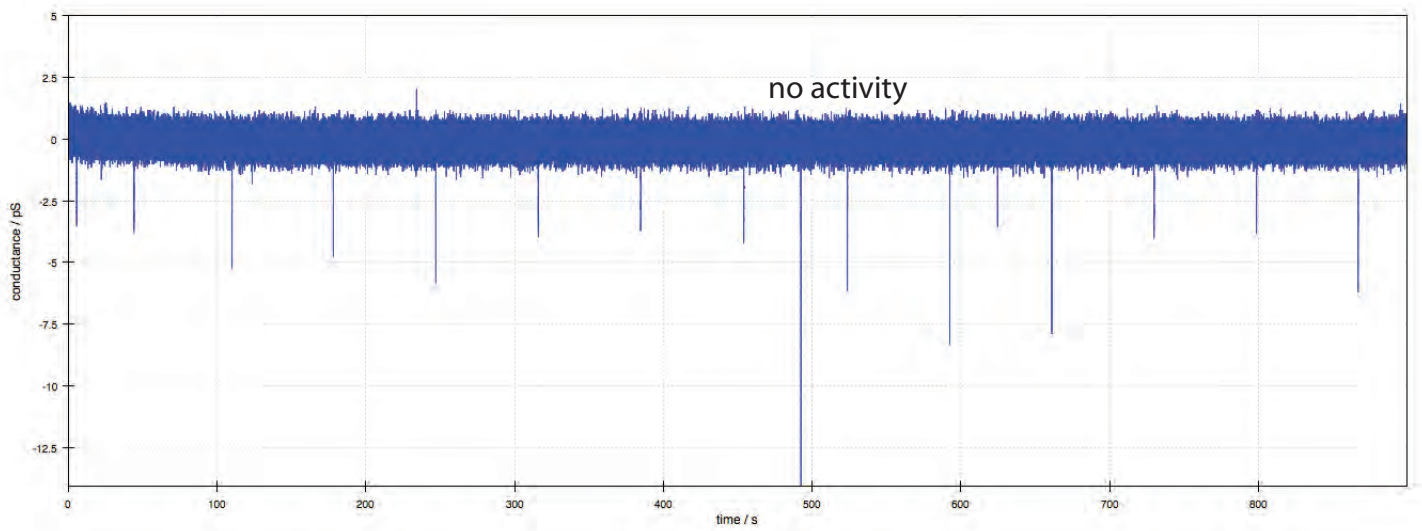
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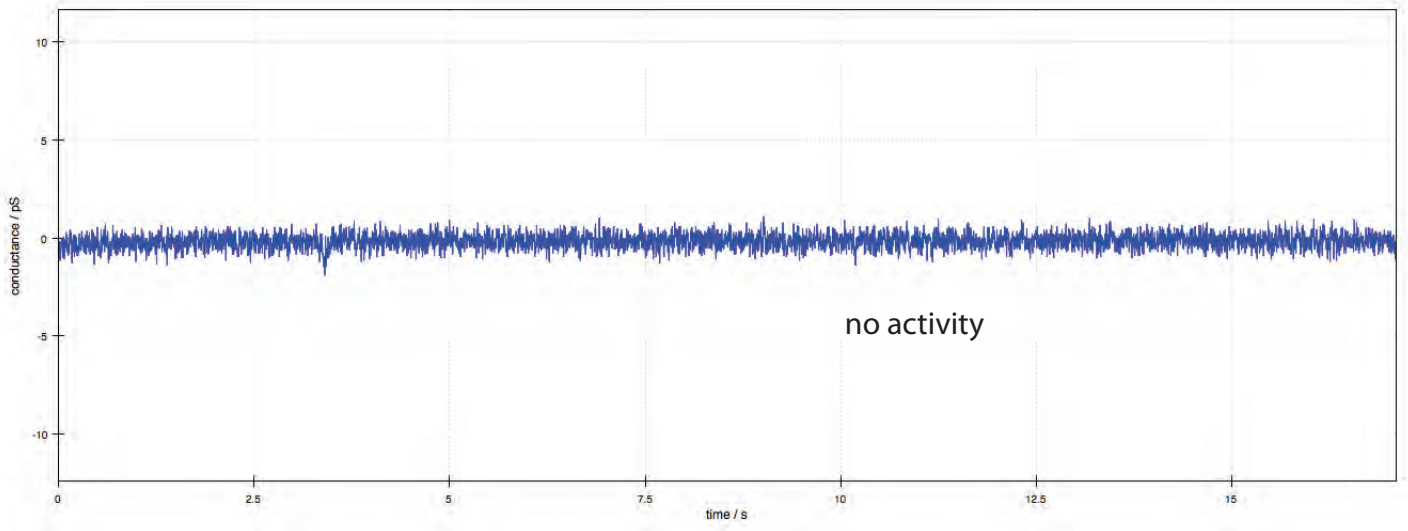
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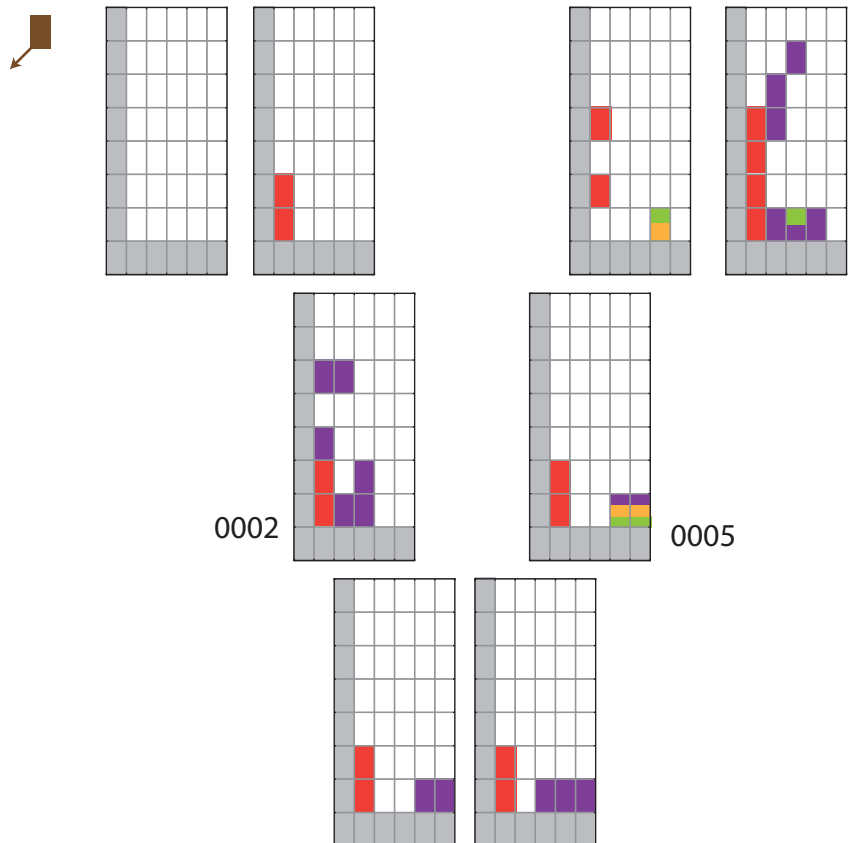
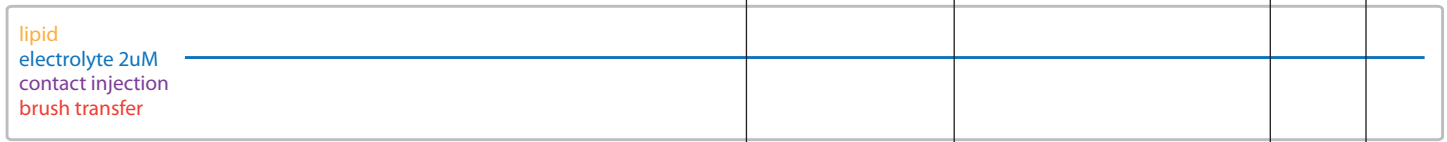
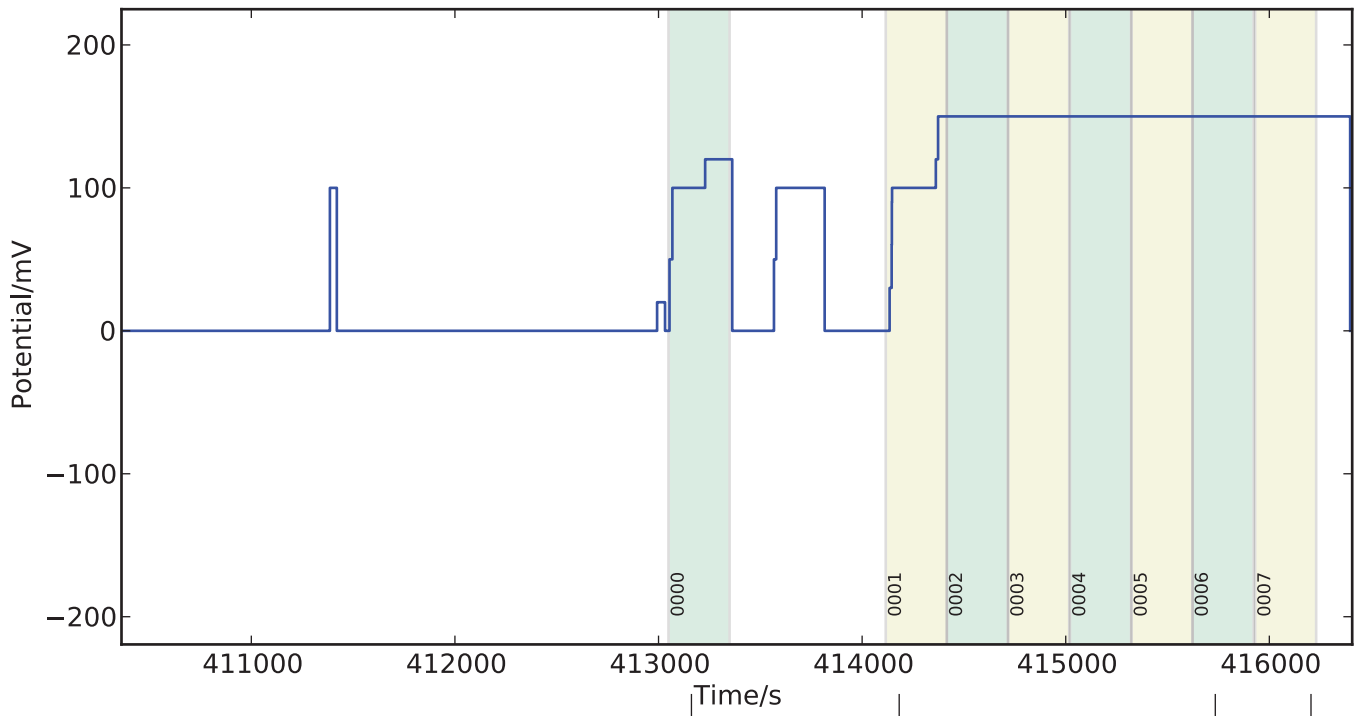
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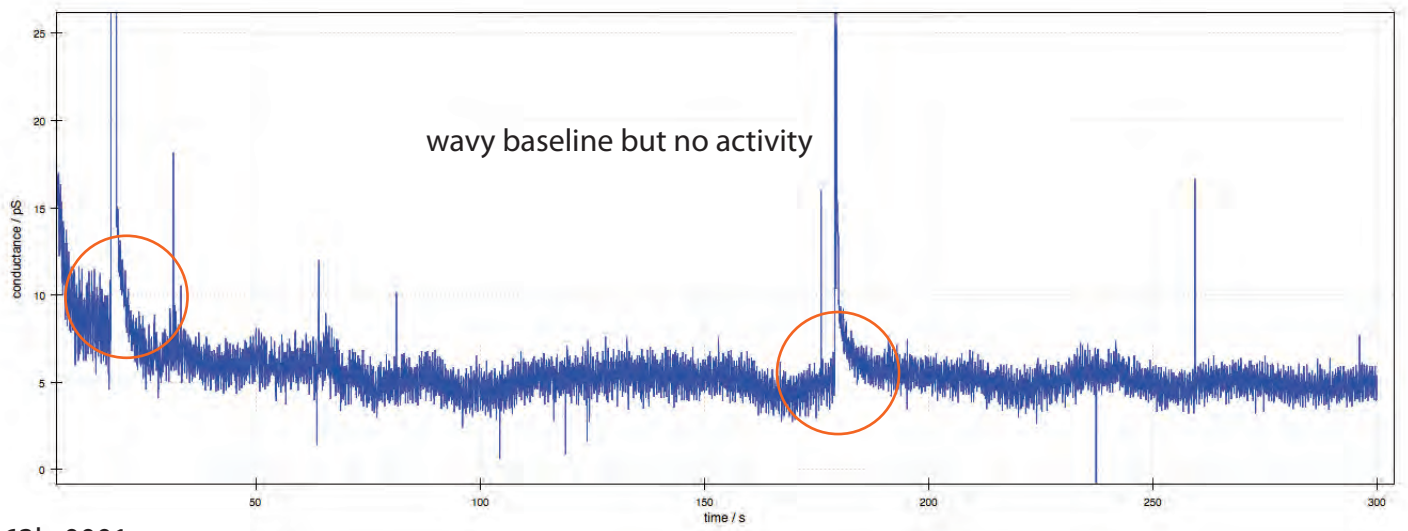
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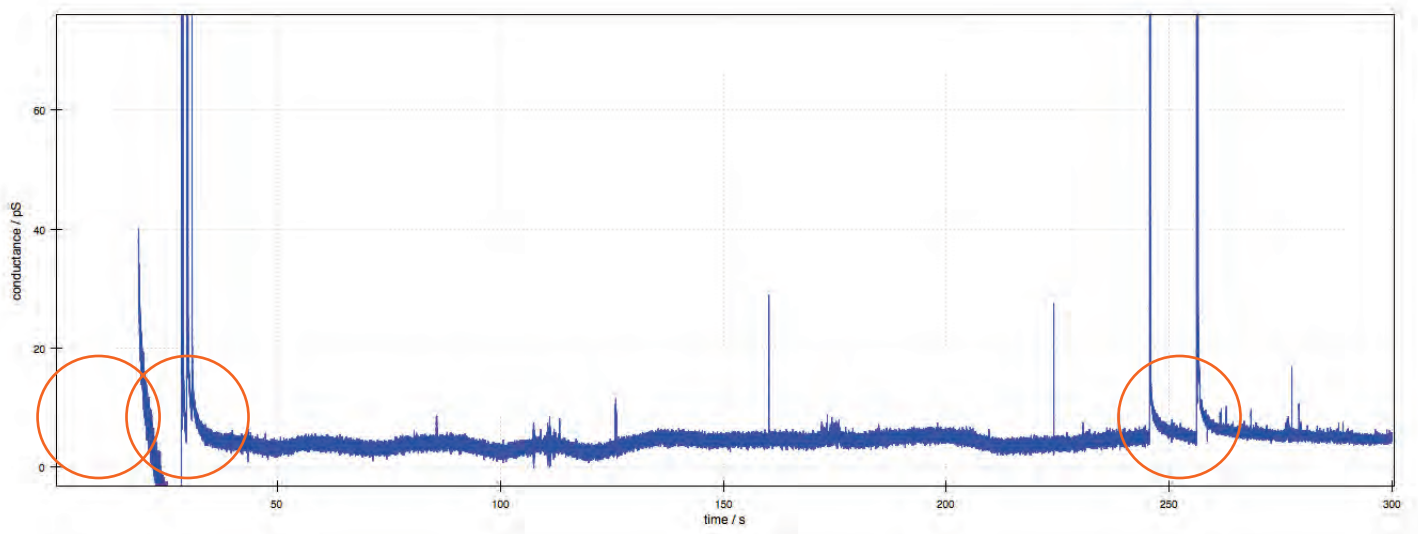
[JC-63] bCD-6E4 - 1M CsCl unbuffered 2uM 7 10uM



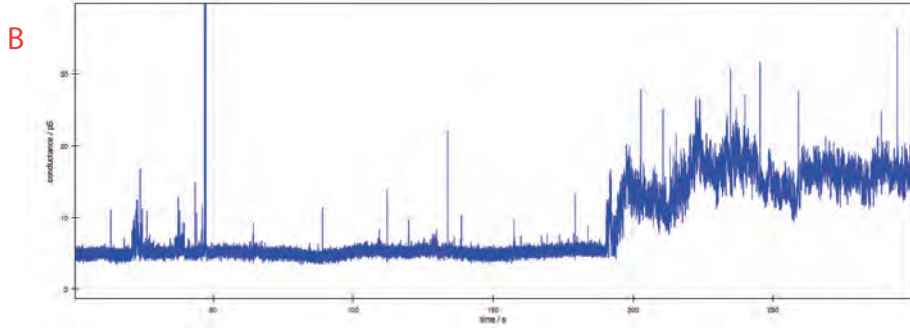
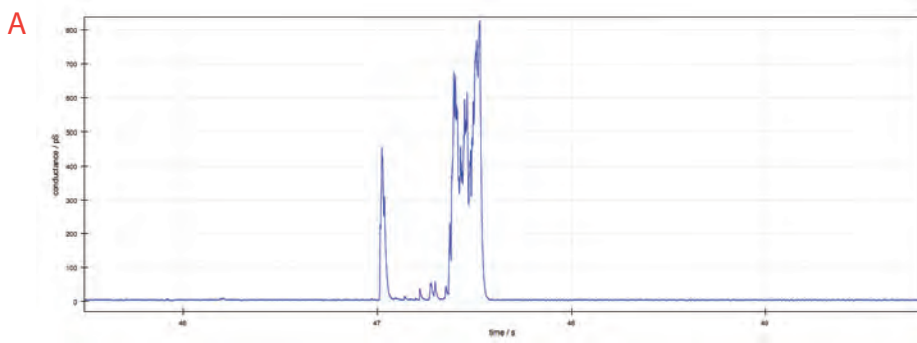
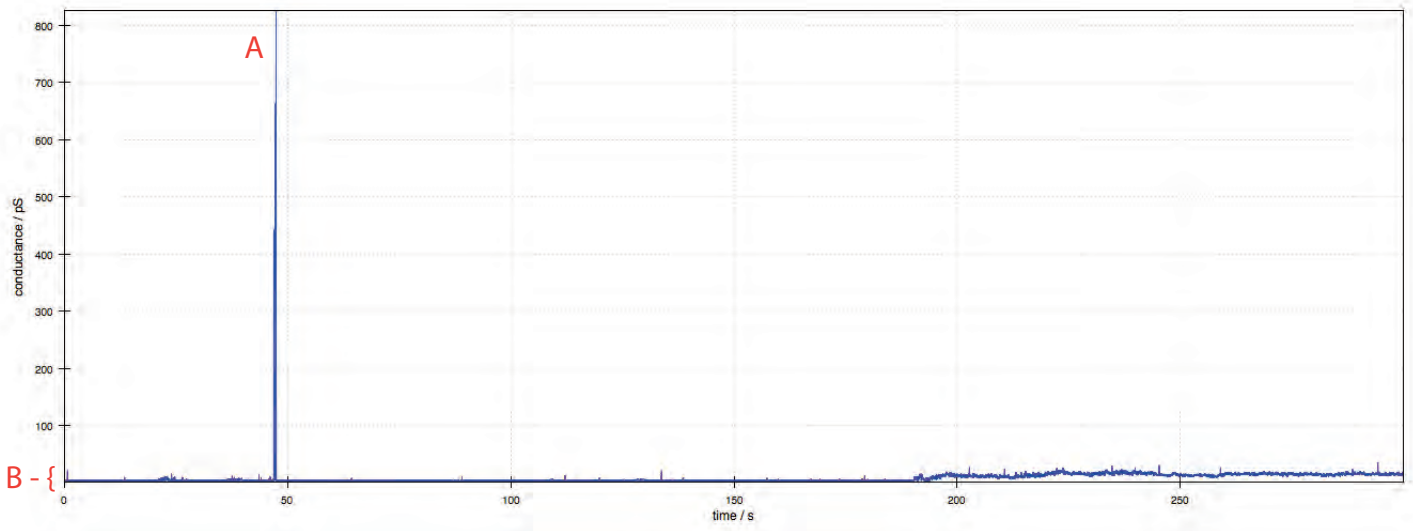
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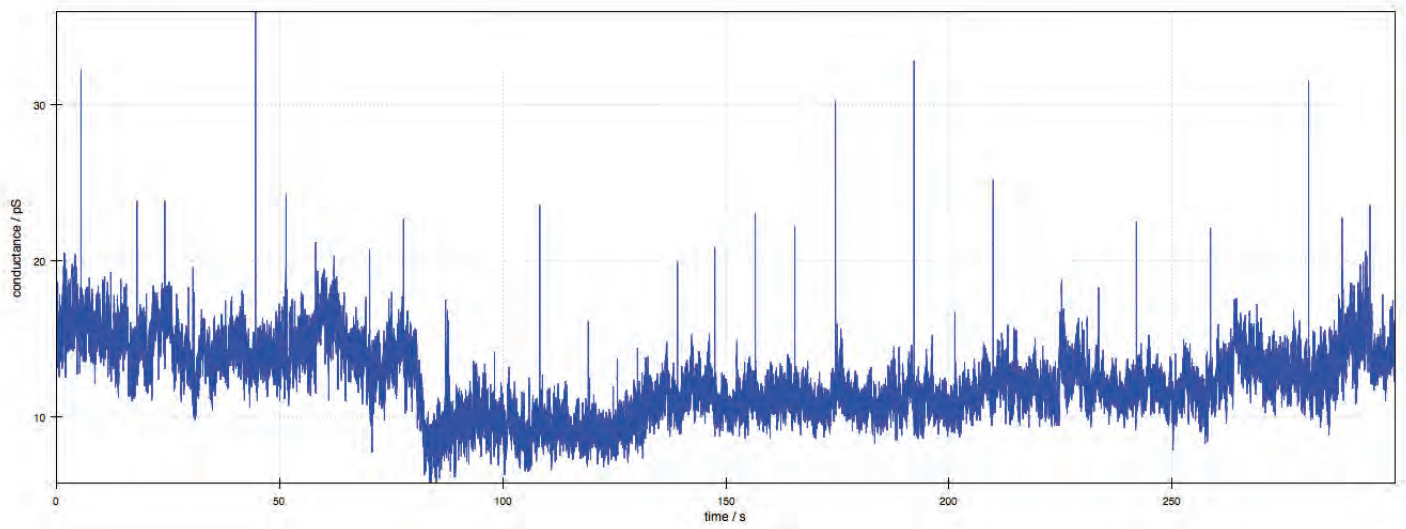
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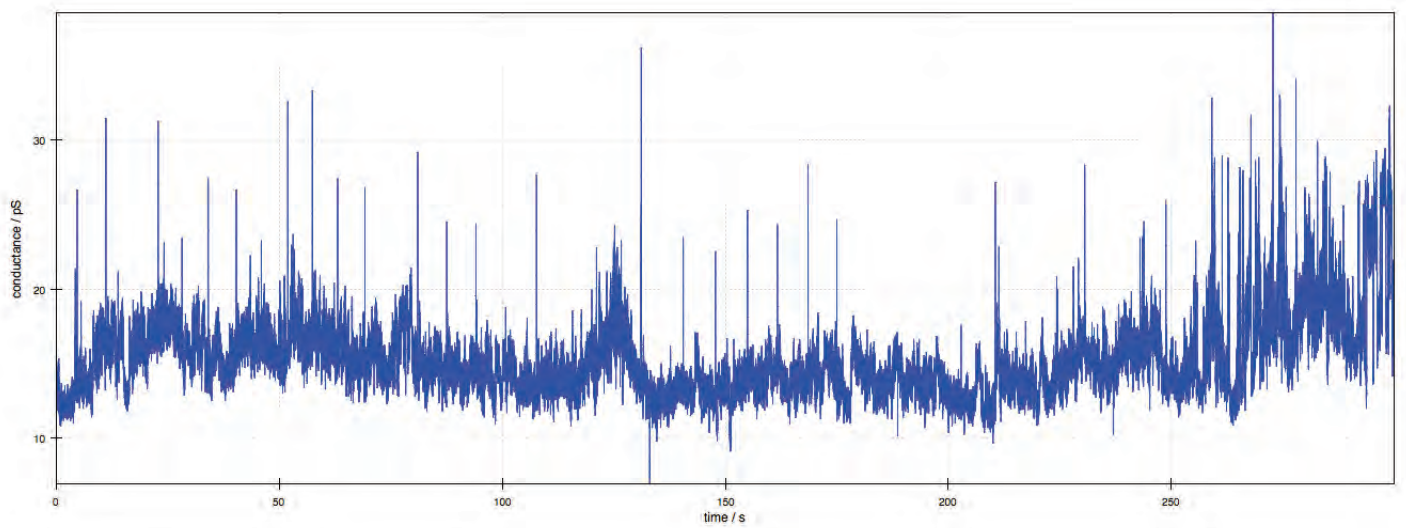
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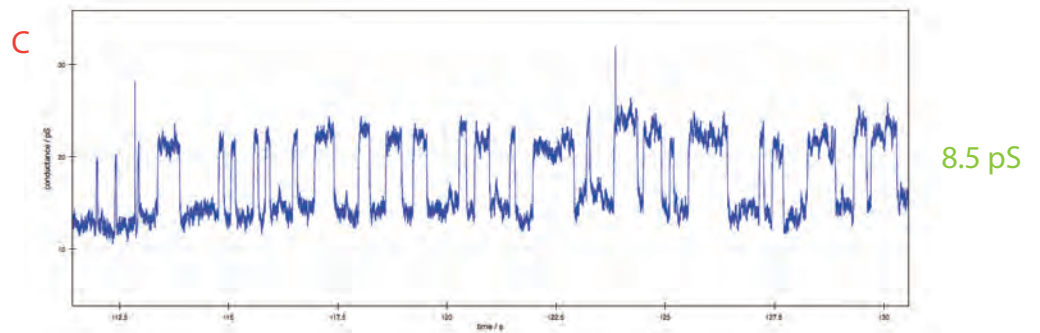
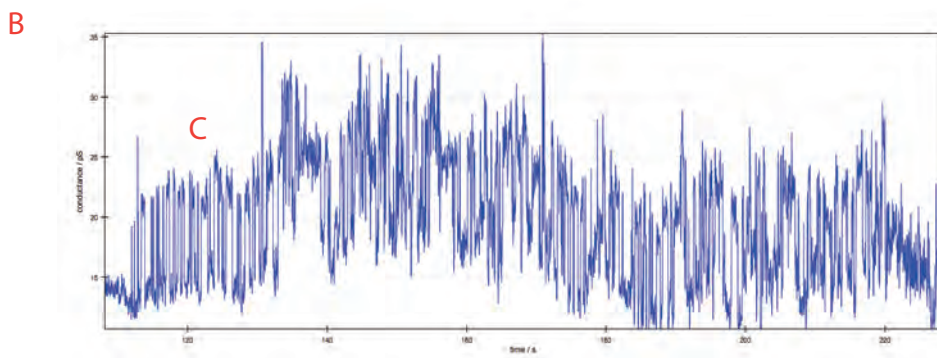
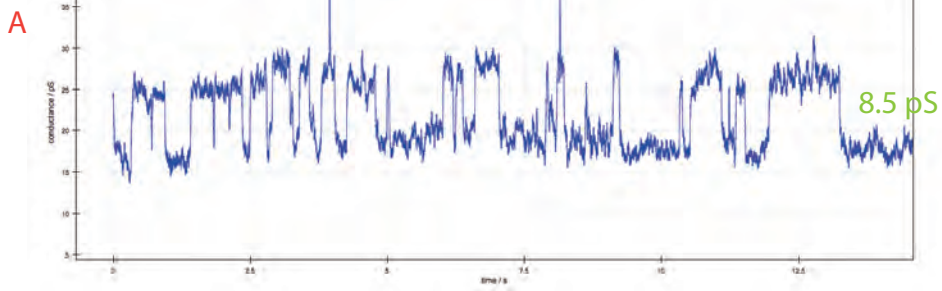
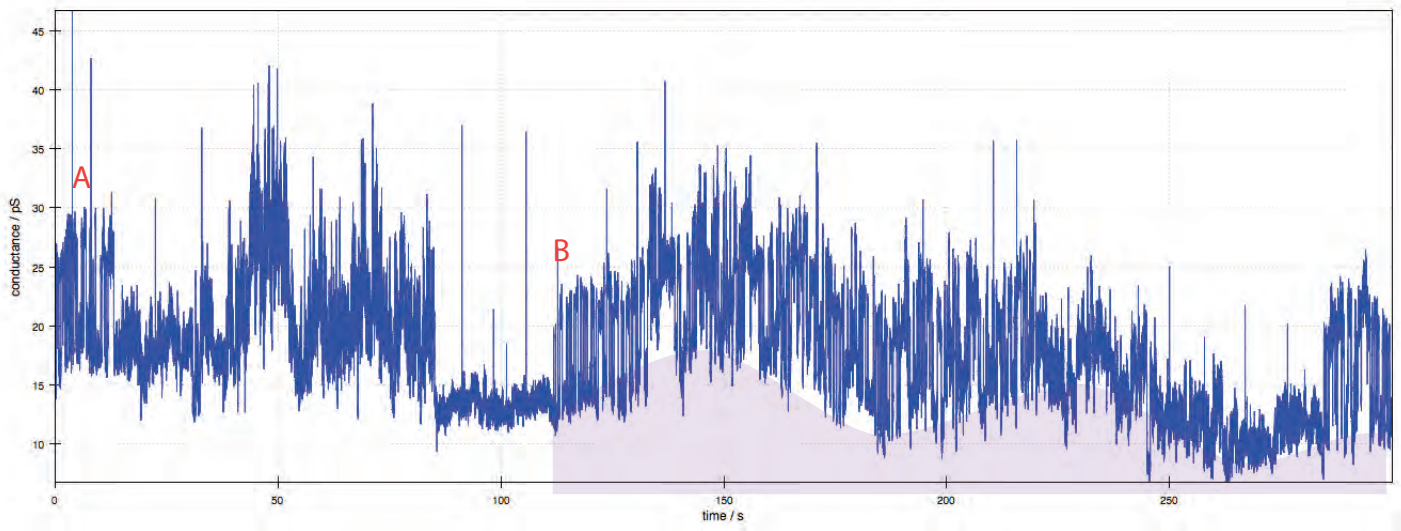
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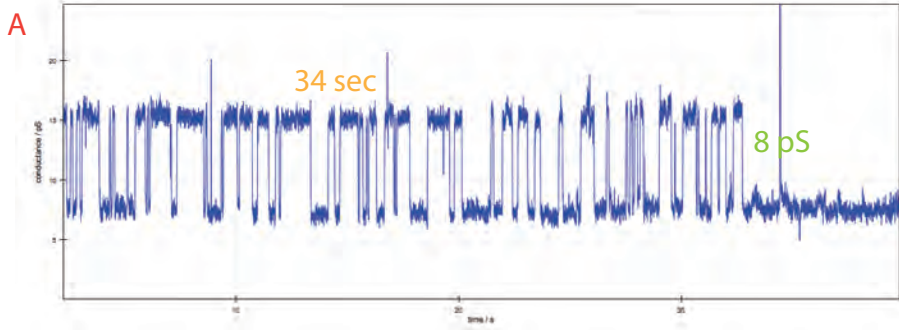
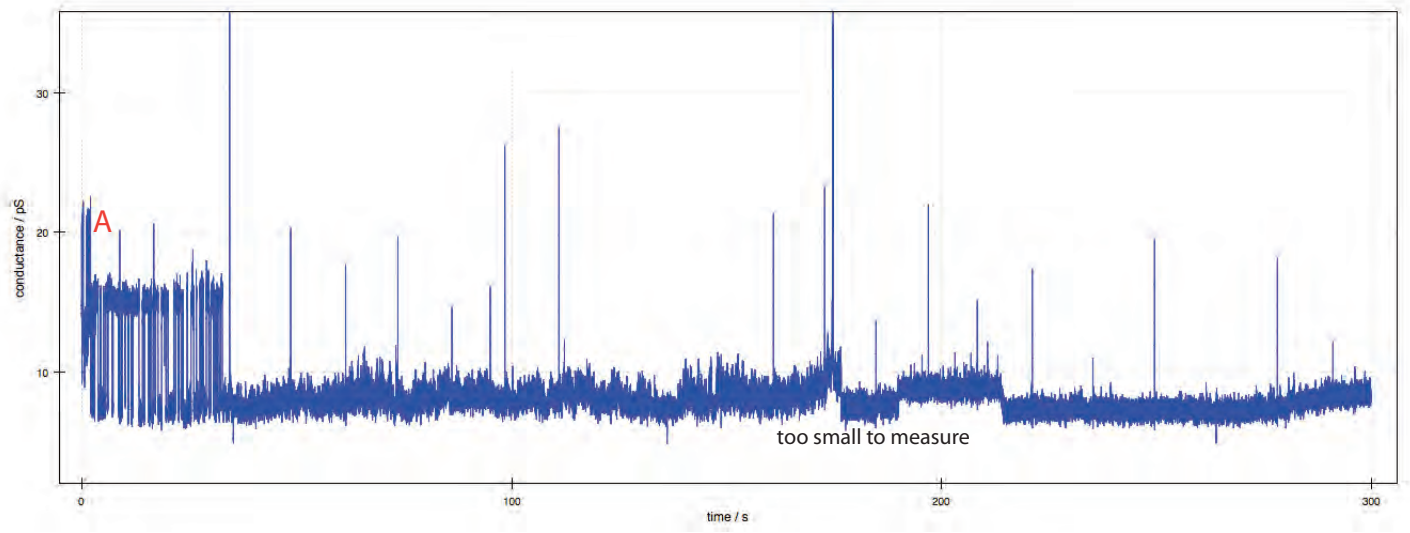
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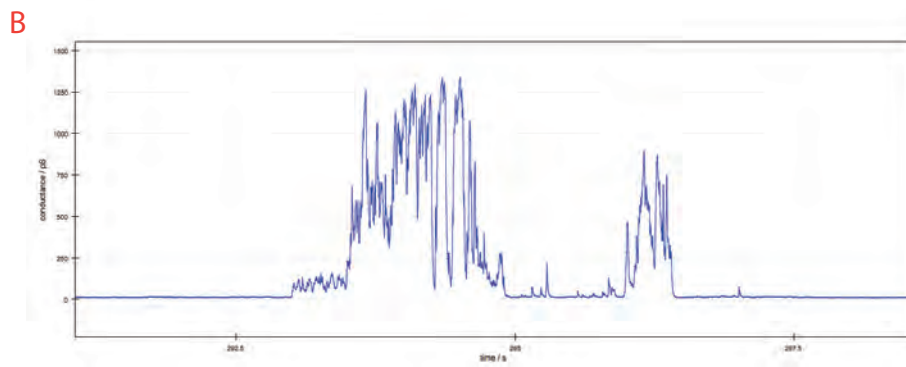
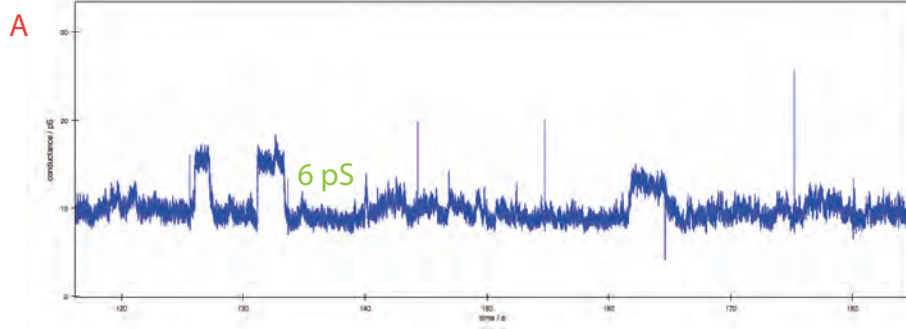
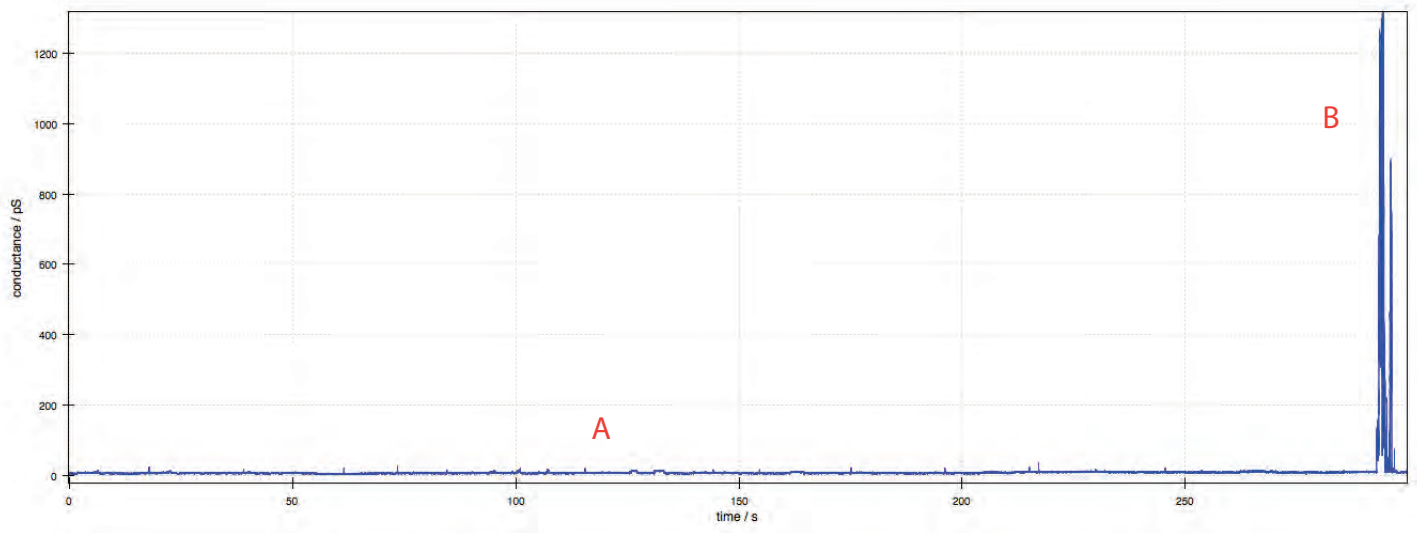
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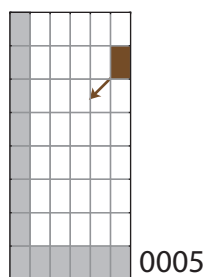
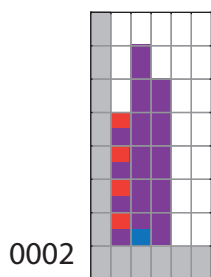
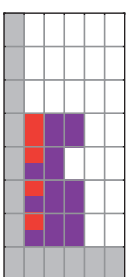
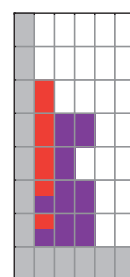
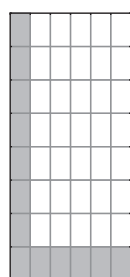
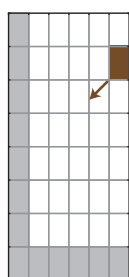
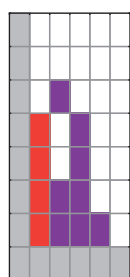
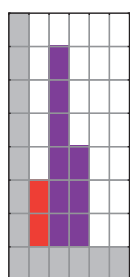
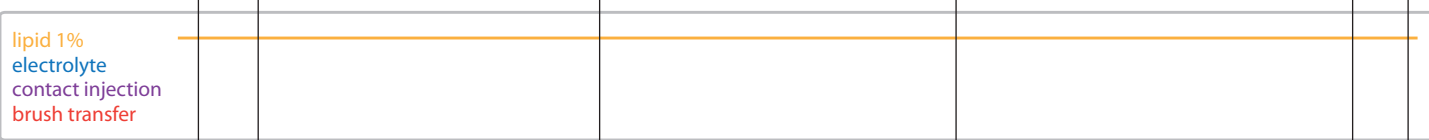
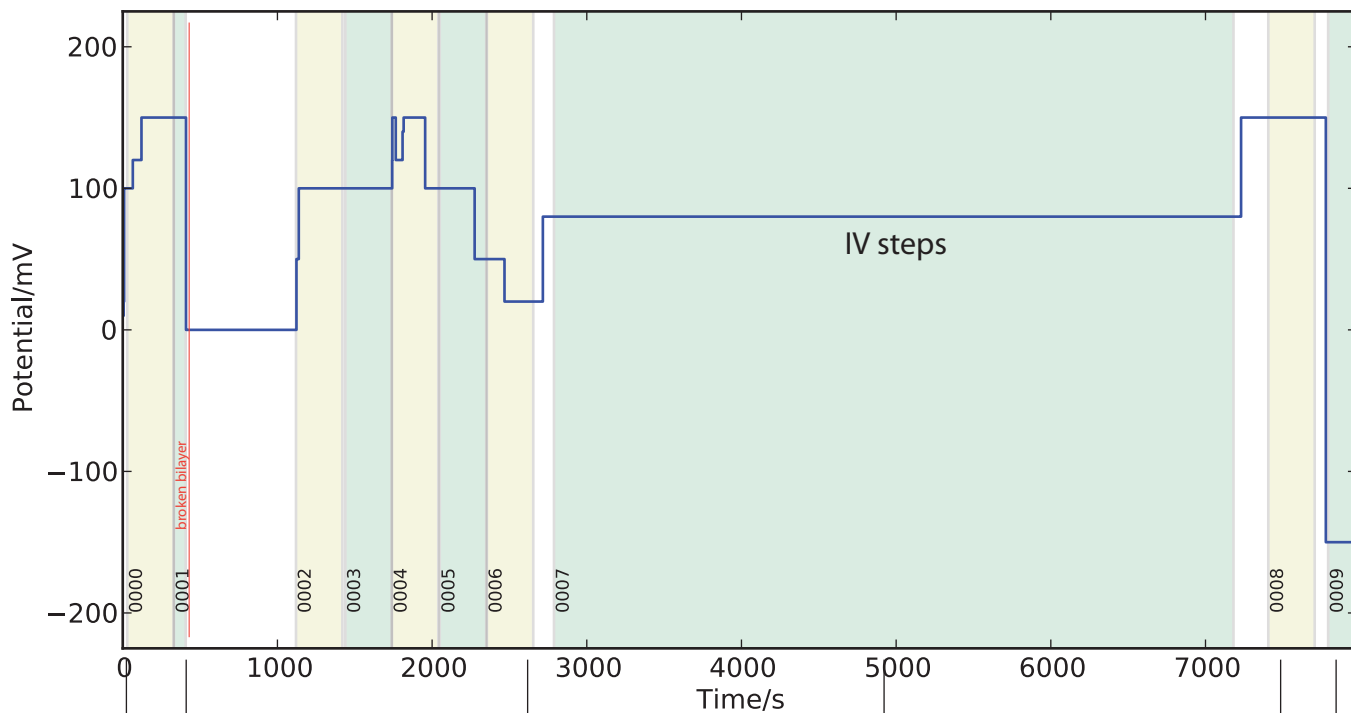
63b-0006



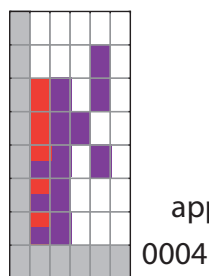
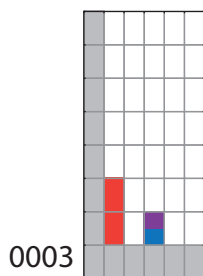
63b-0007



[JC-65] bCD-6E4 - 1M CsCl unbuffered 1percent

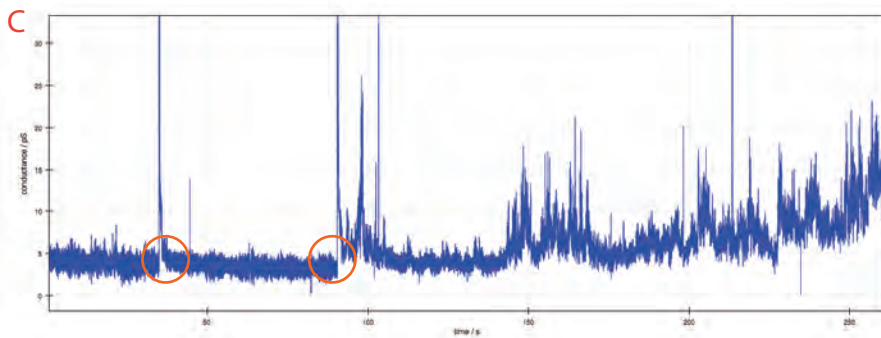
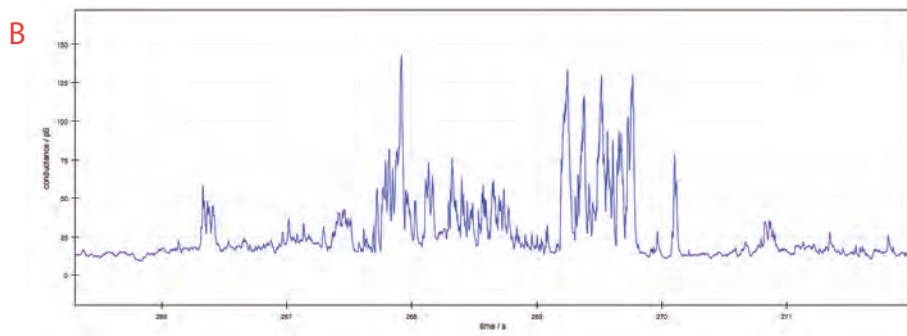
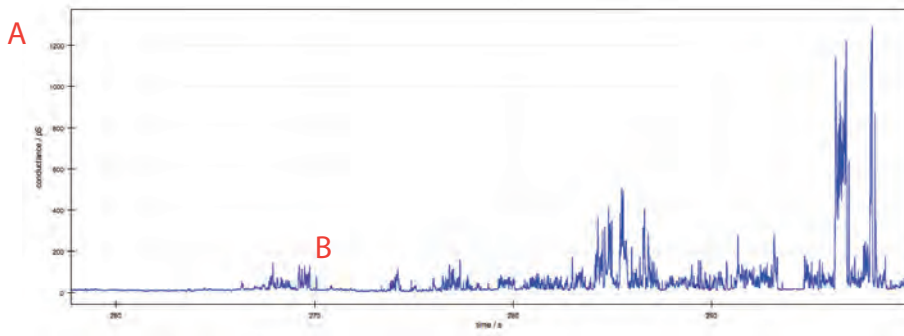
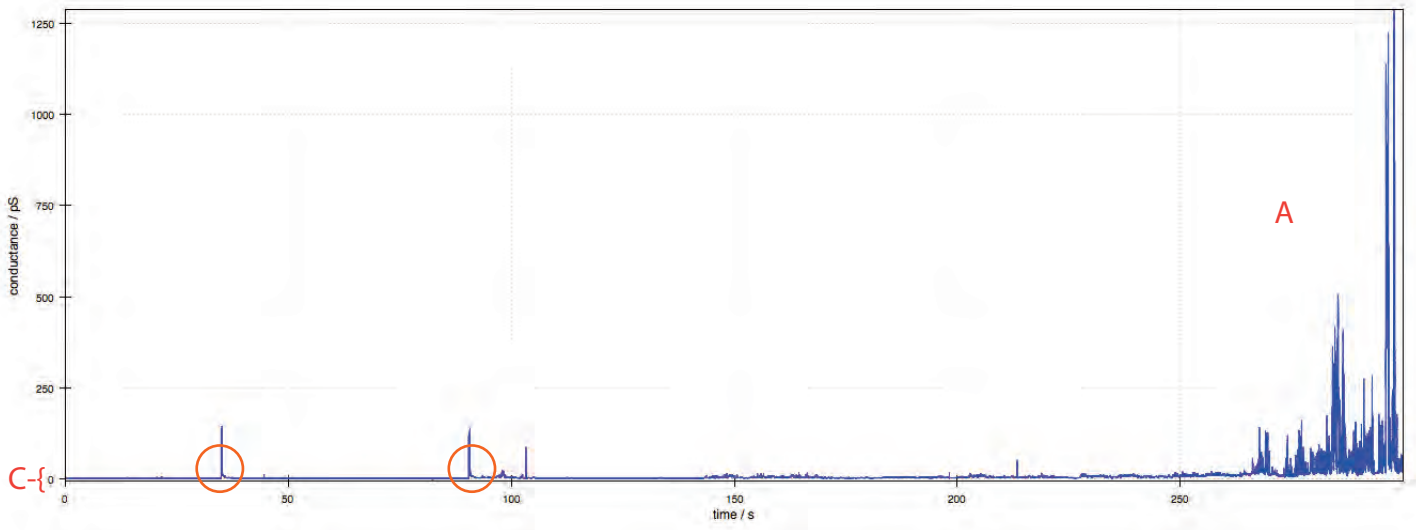


80 -> -80mV
4mV steps

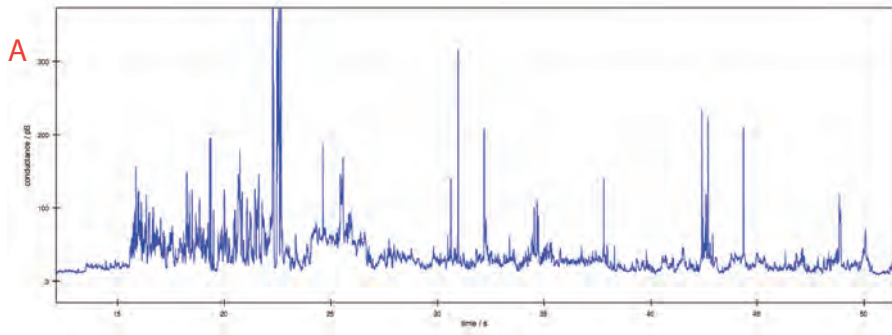
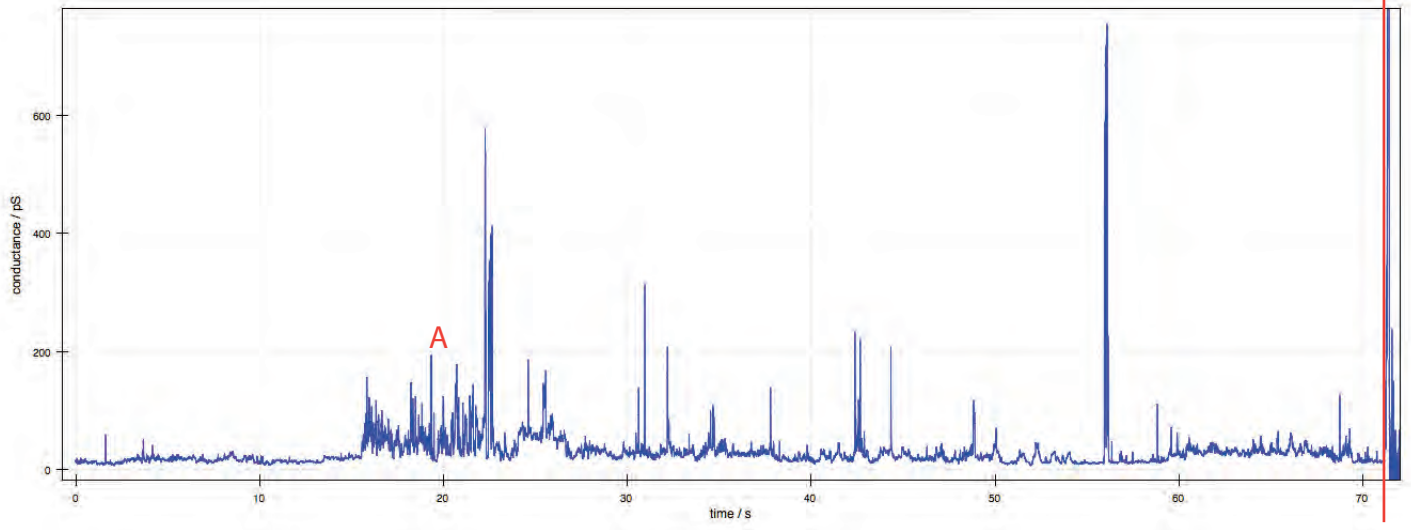


apparent potential/history dependence?

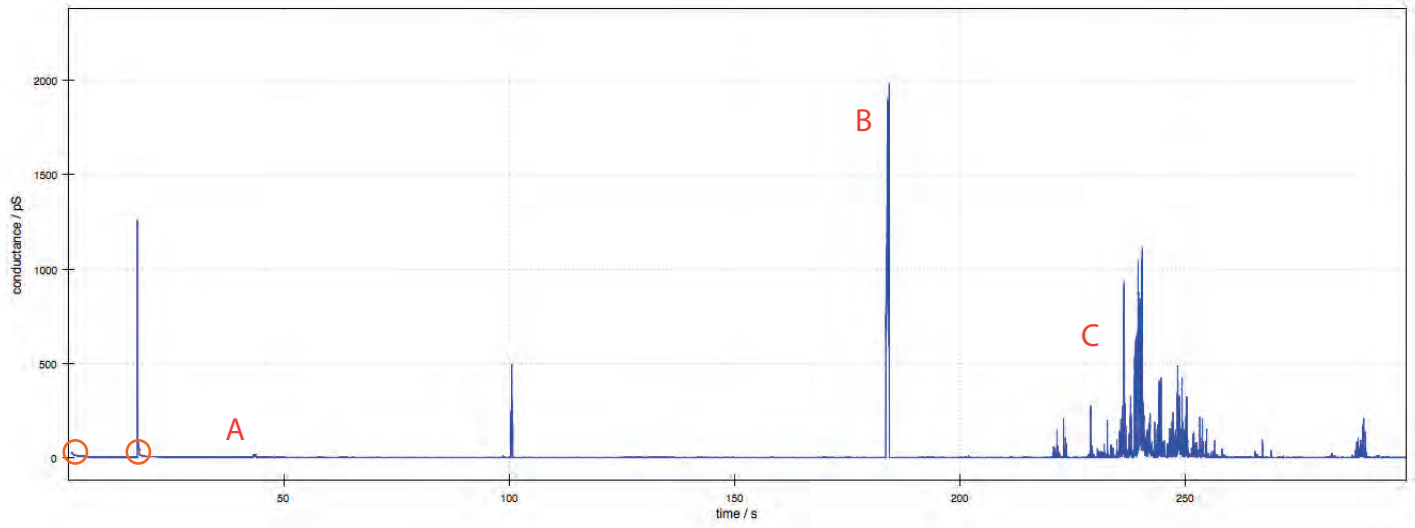
65-0000



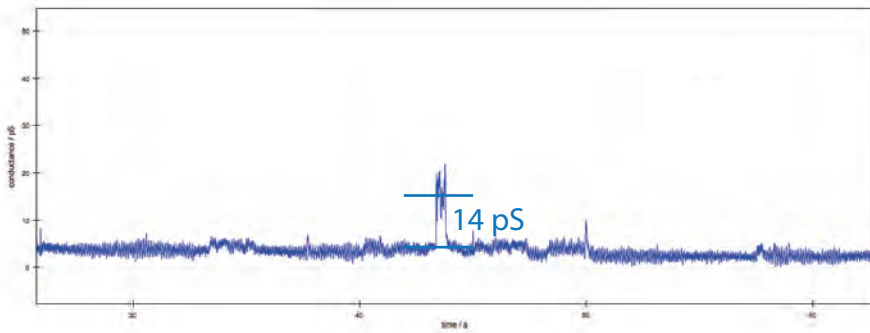
65-0001



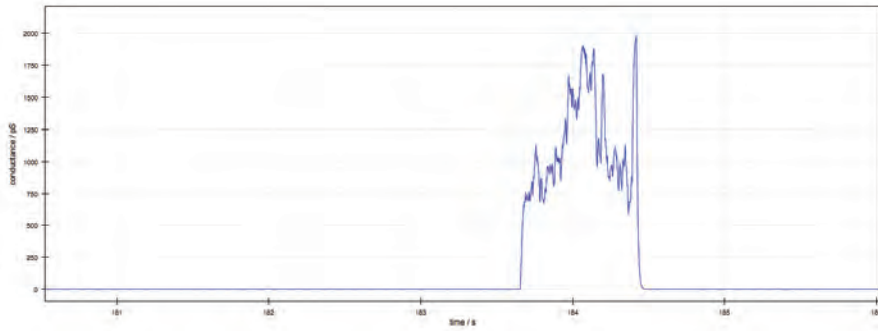
65-0002



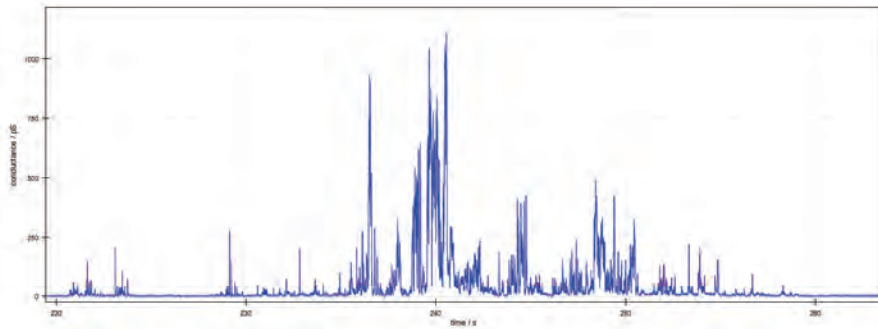
A



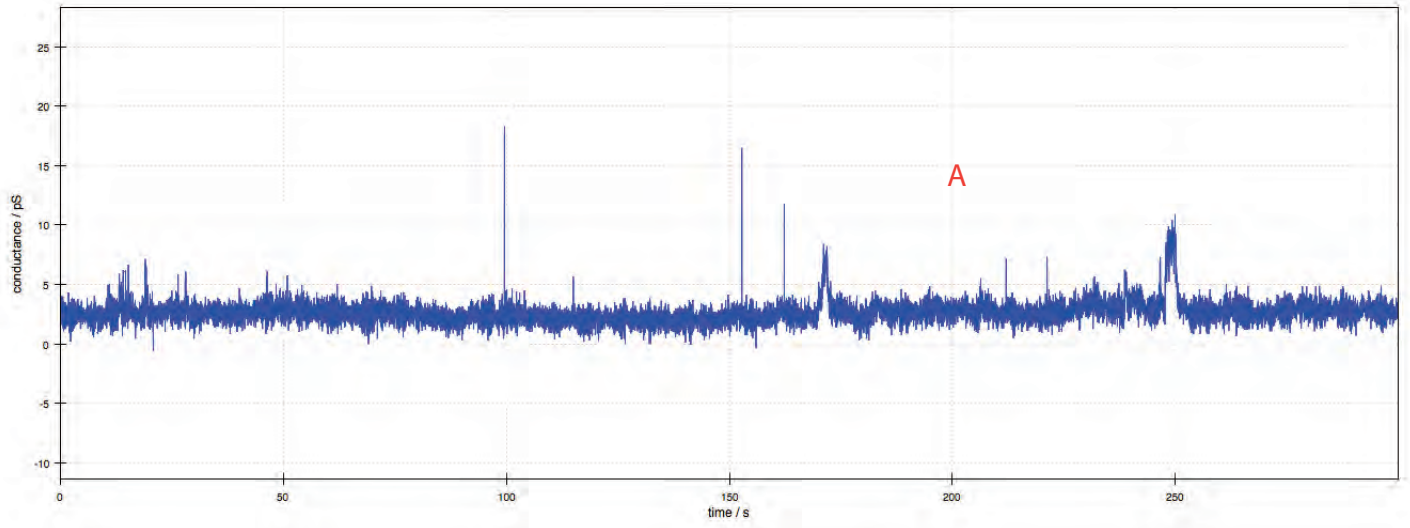
B



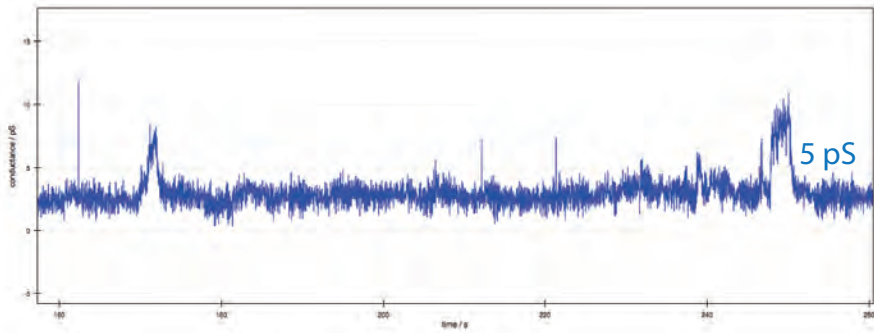
C



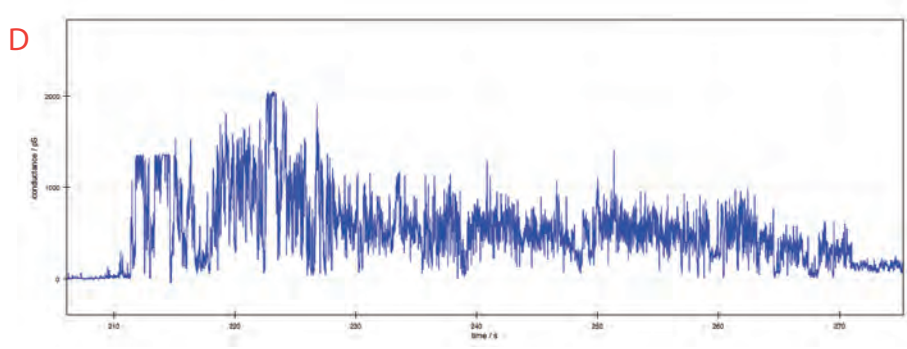
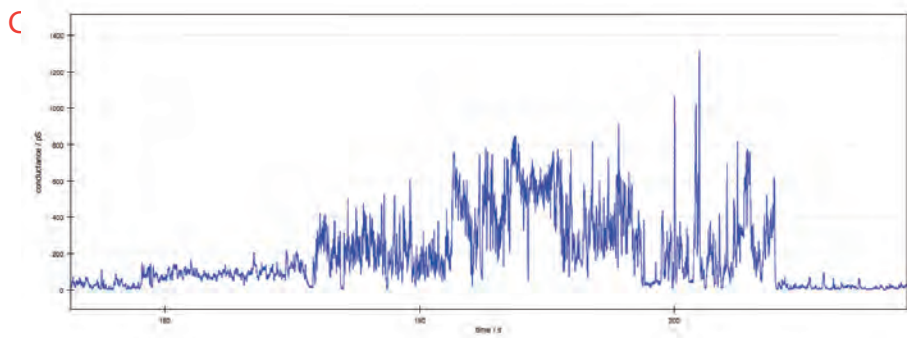
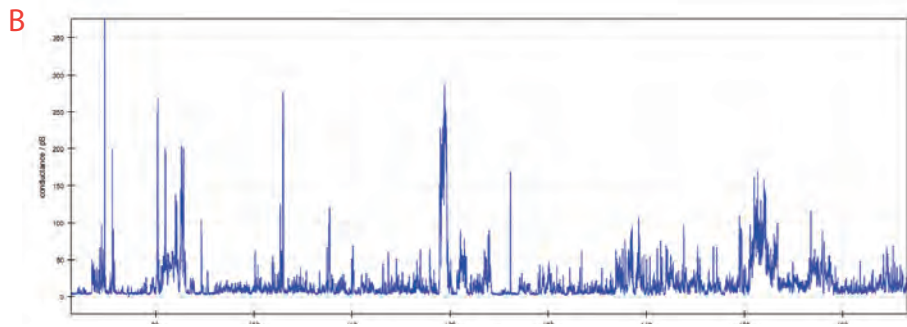
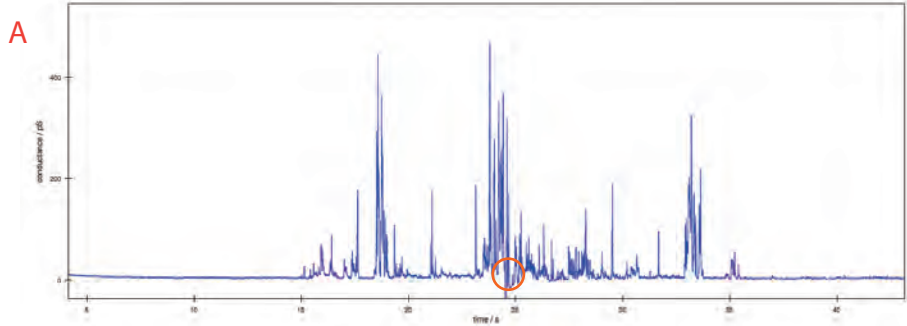
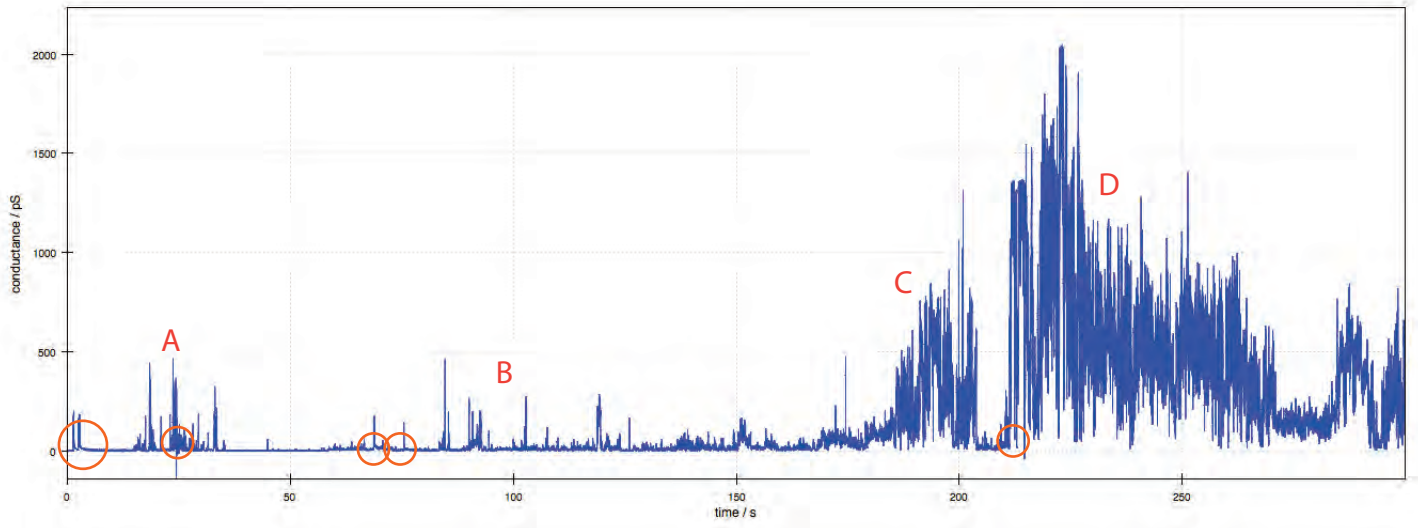
65-0003



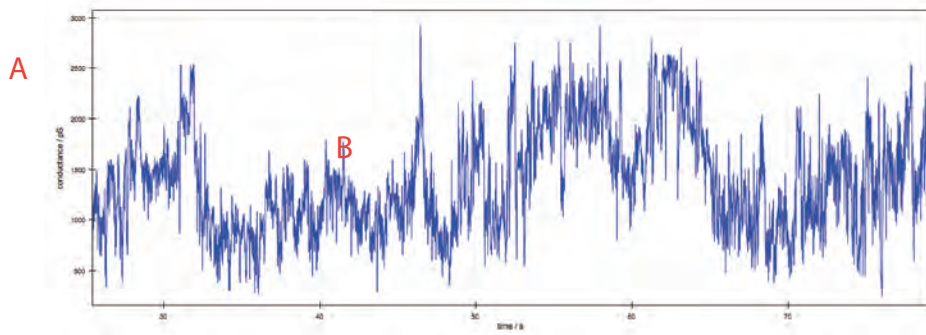
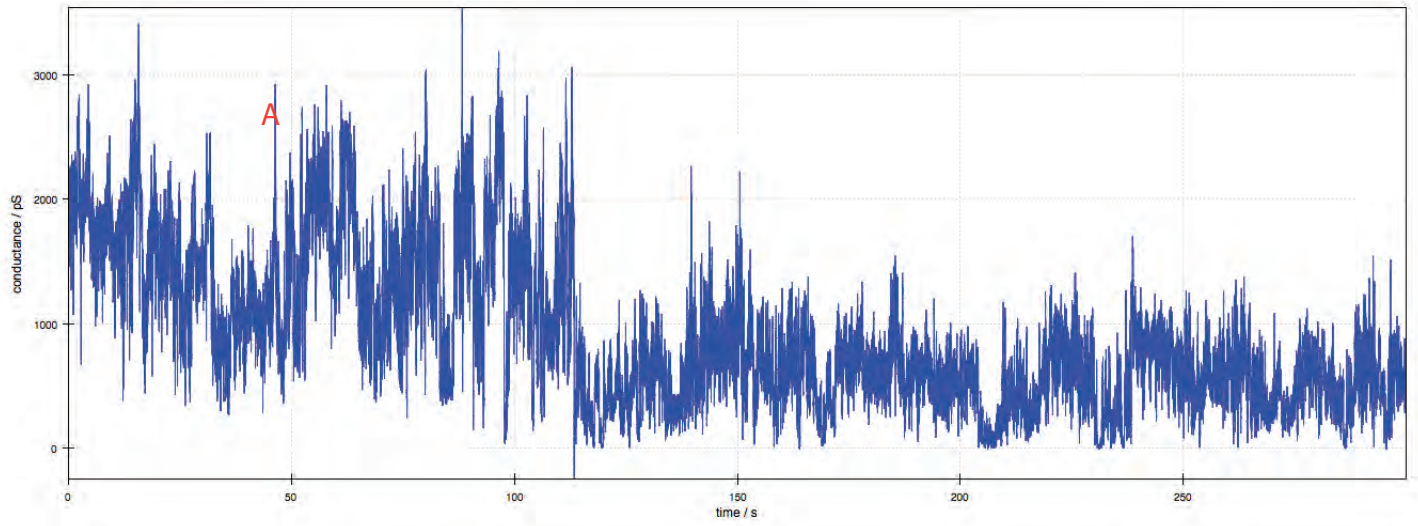
A



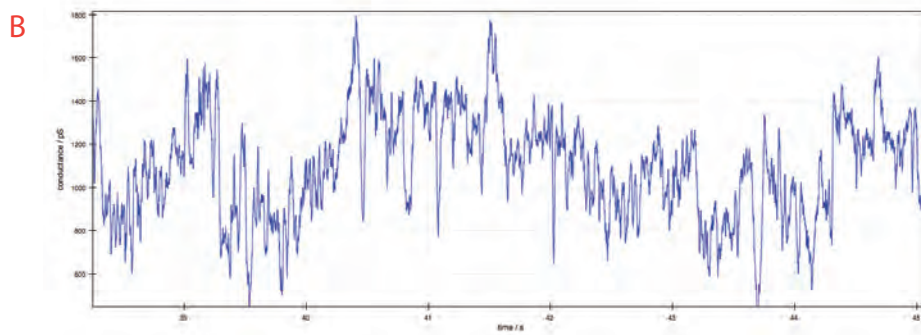
65-0004



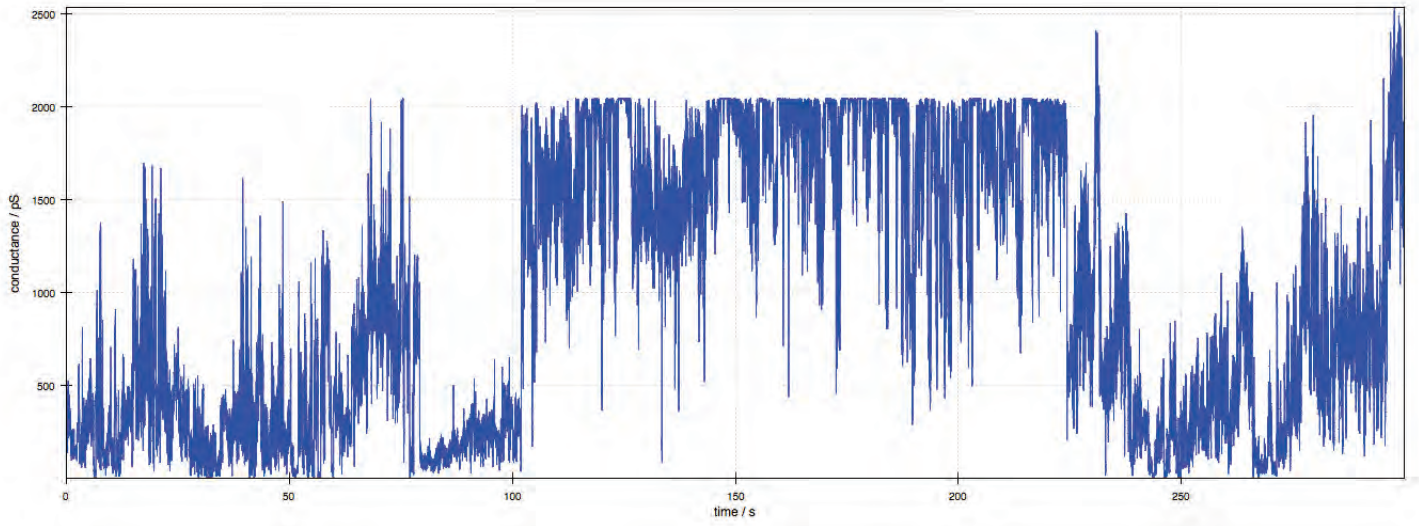
65-0006



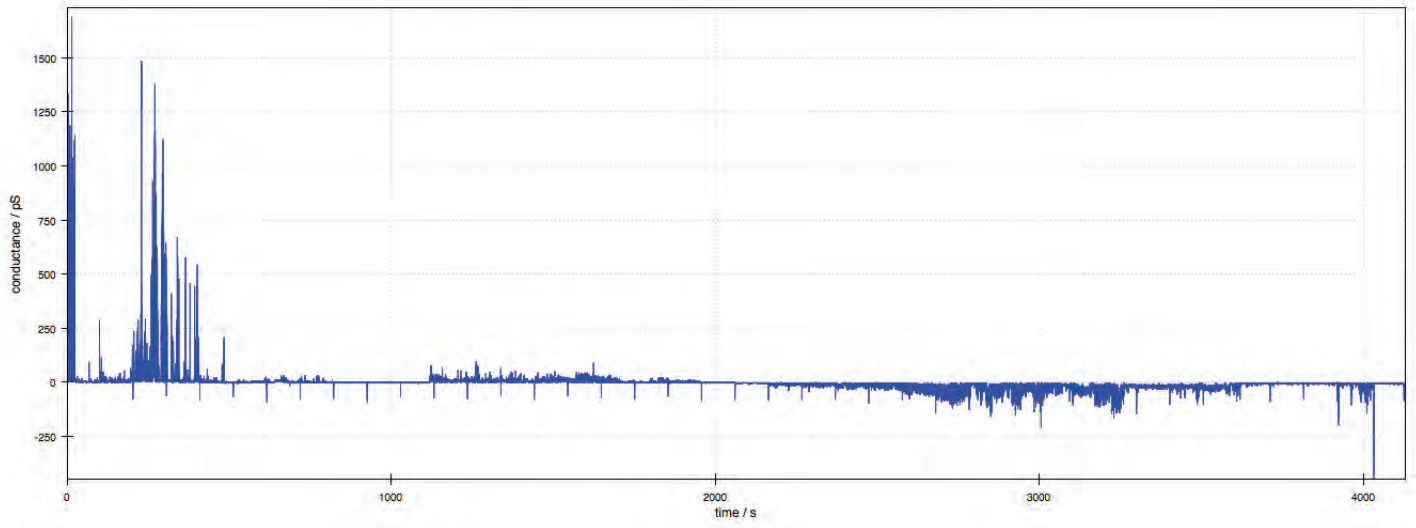
Fractal?



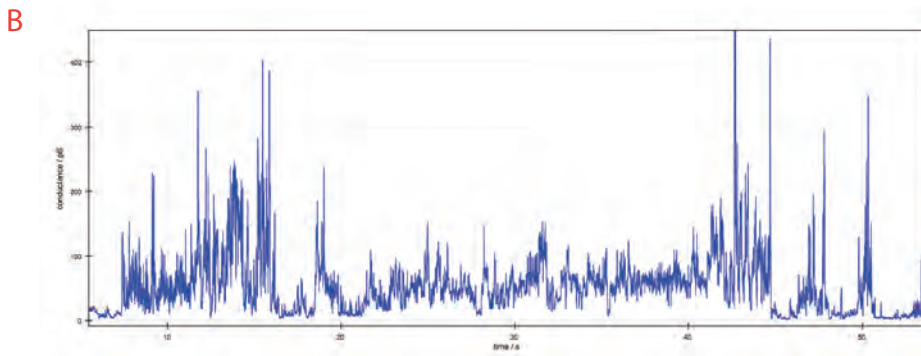
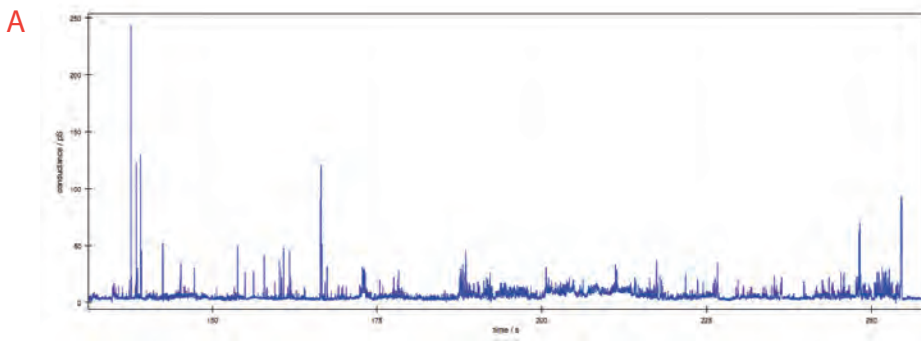
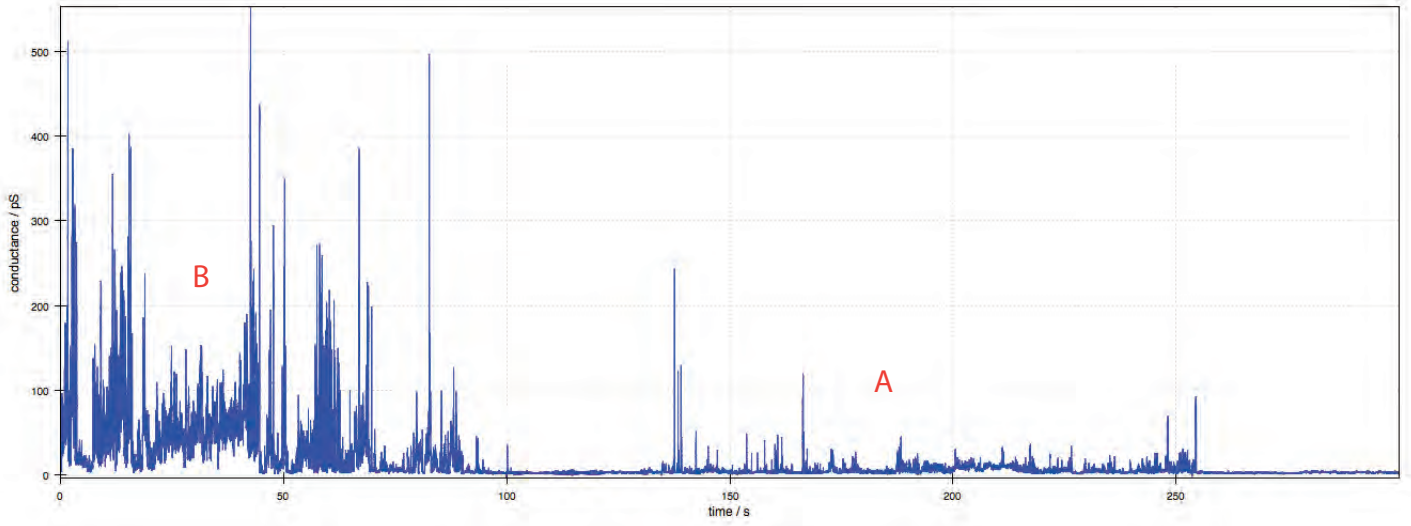
65-0005



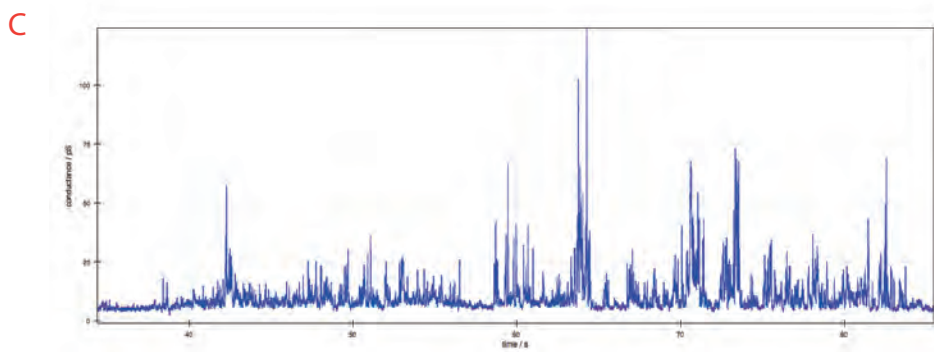
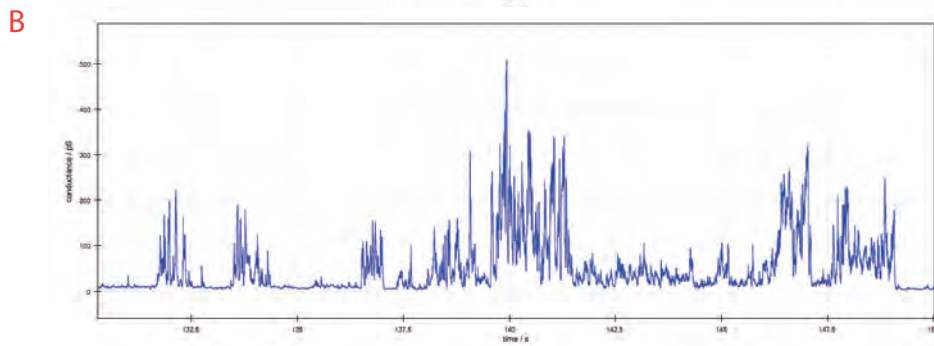
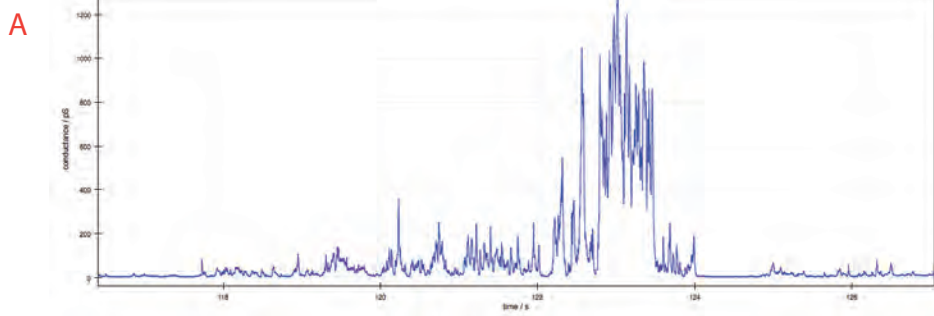
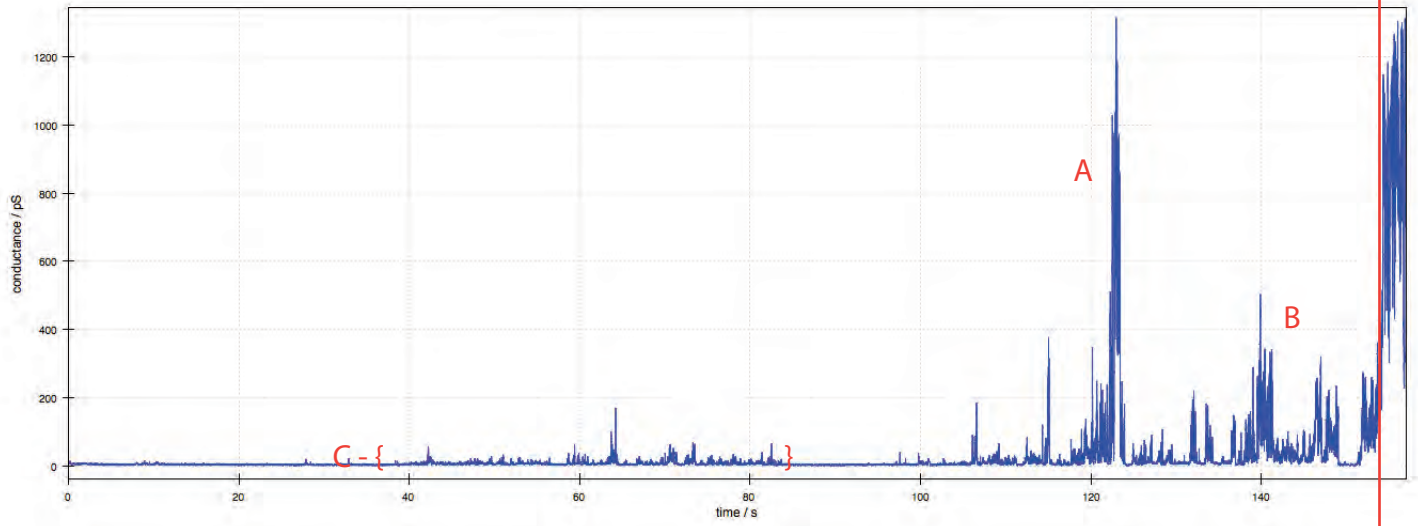
65-0007 (IV)



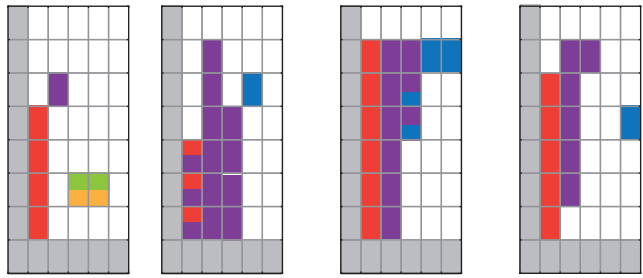
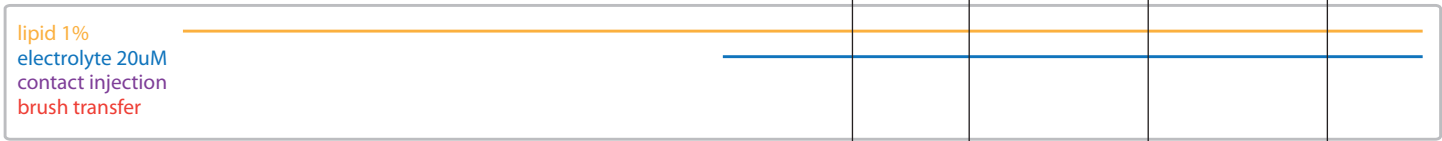
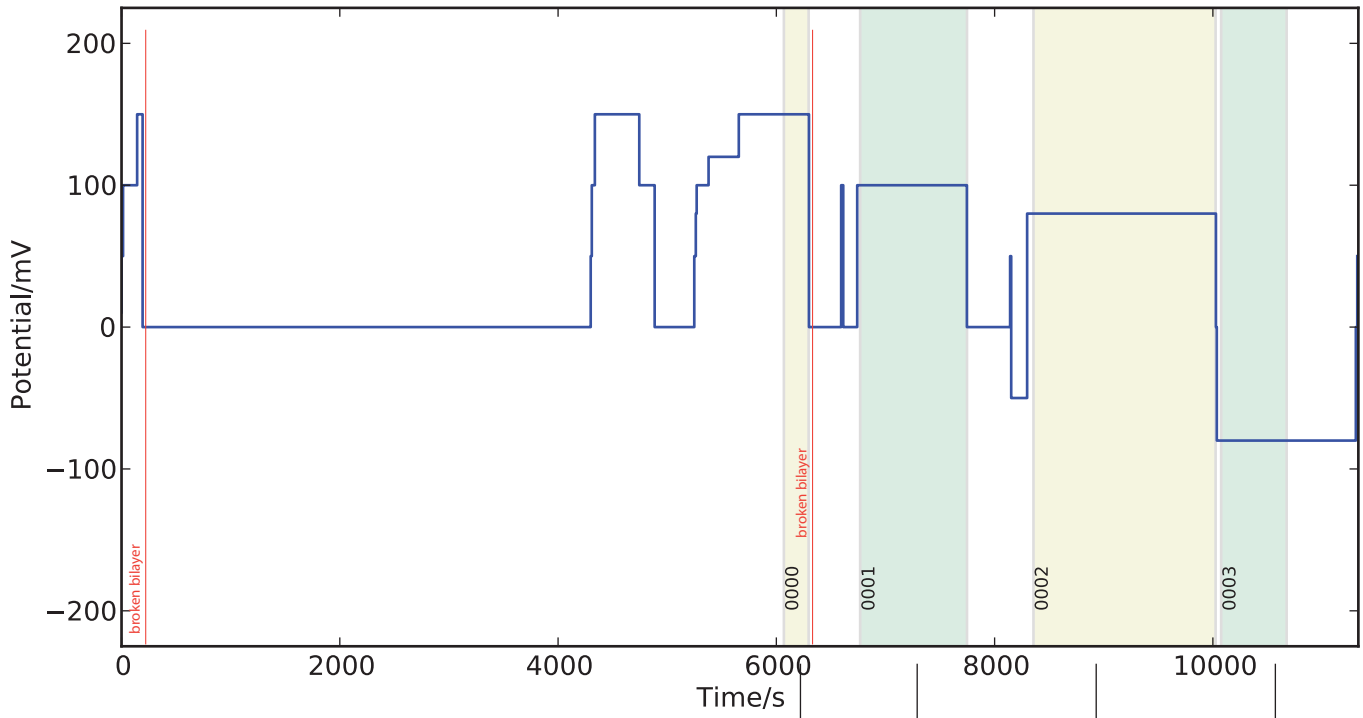
65-0008



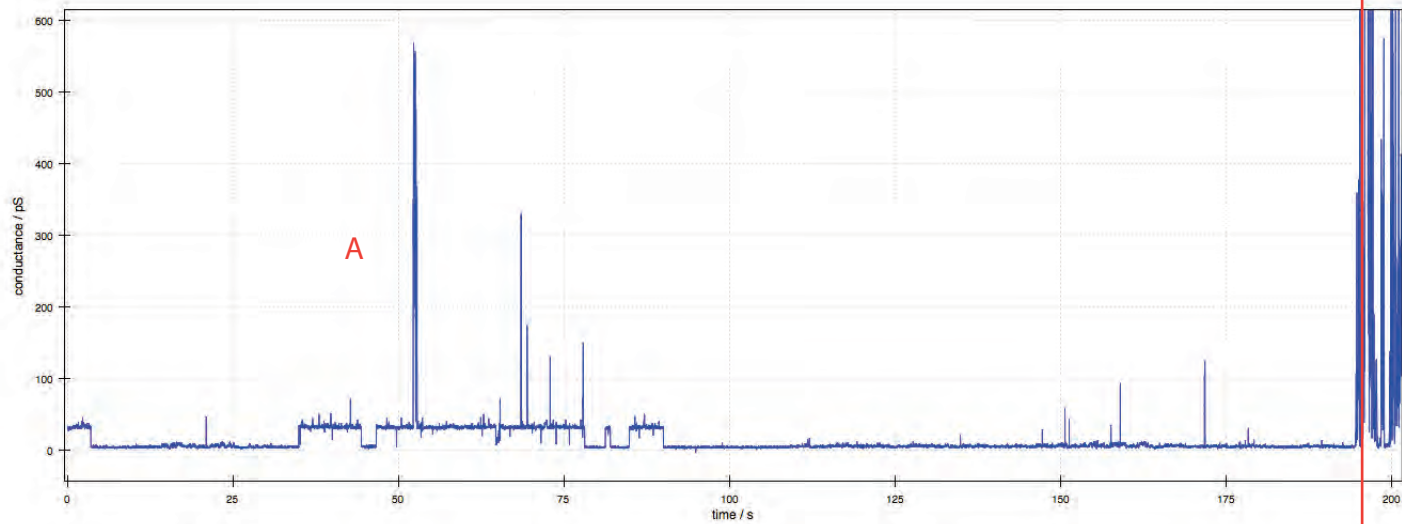
65-0009



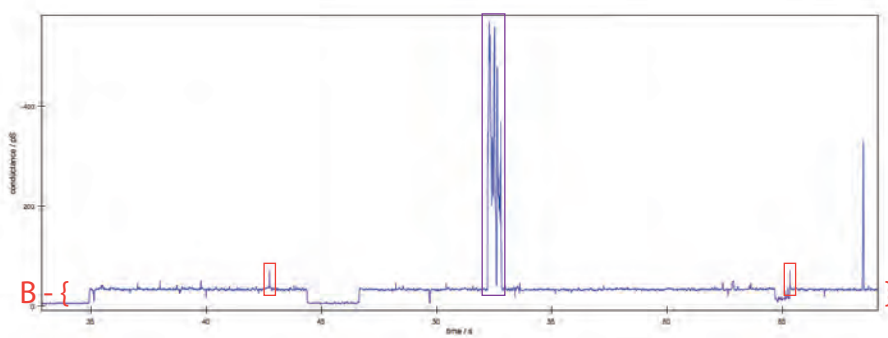
[JC-70] bCD-6Es-4 JC-T-13 1MCsCl pH7 1perc



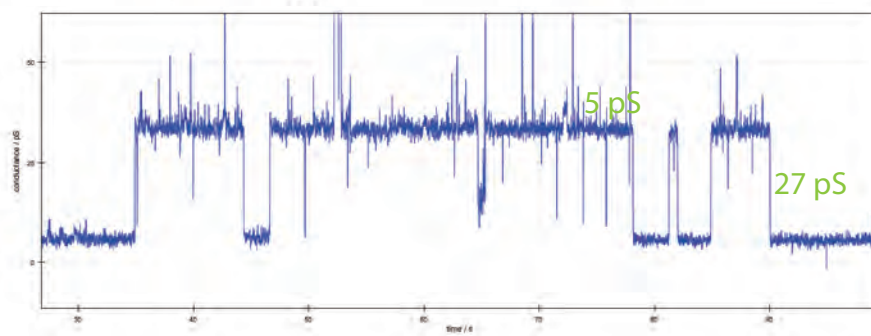
70-0000



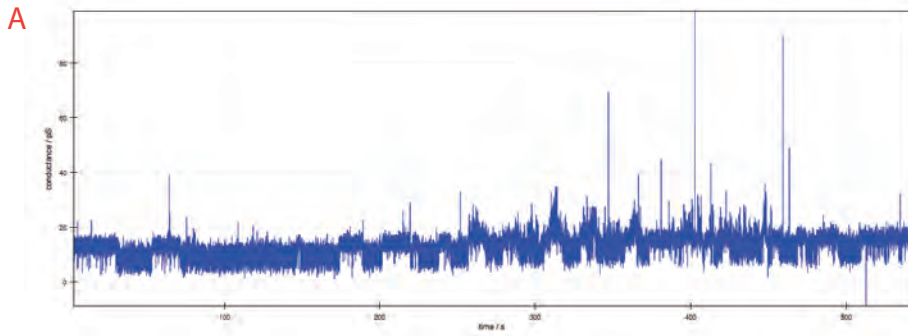
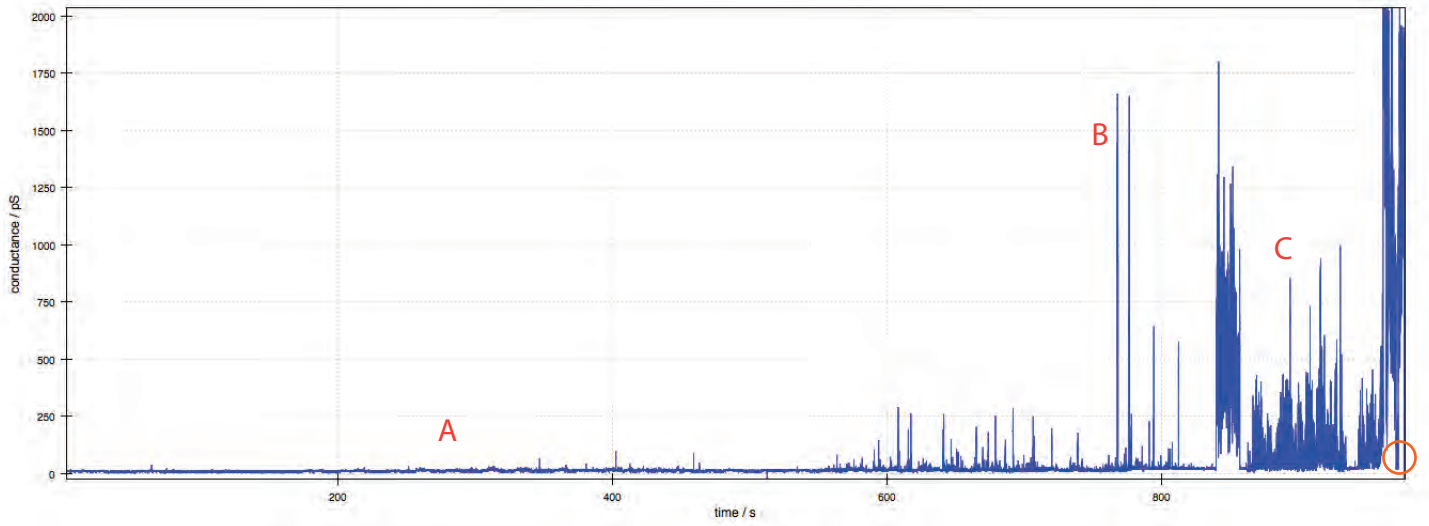
A



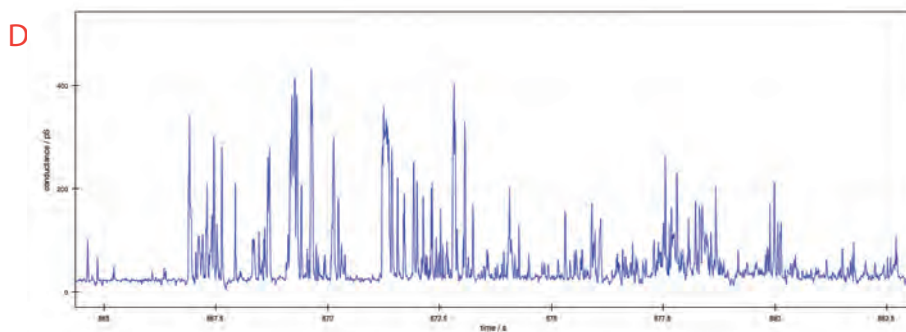
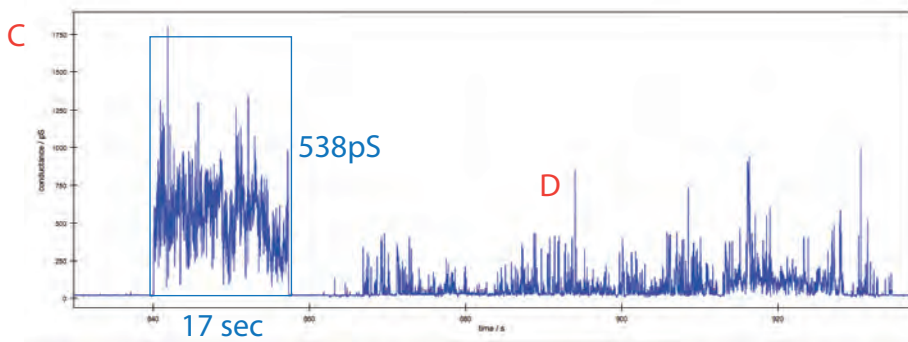
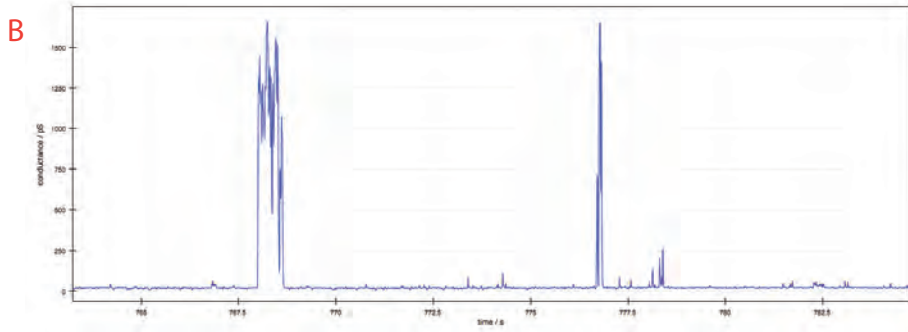
B

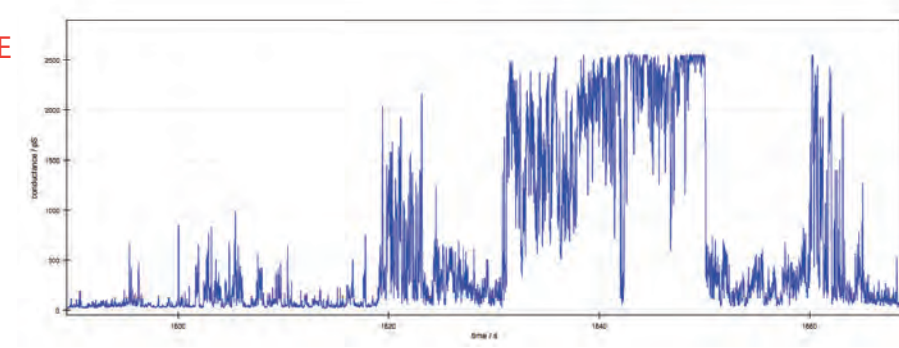
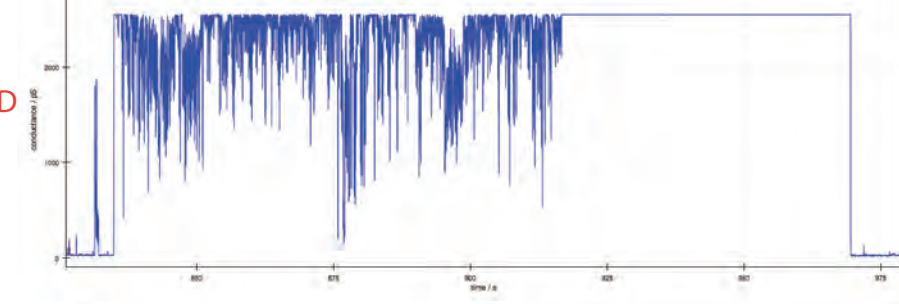
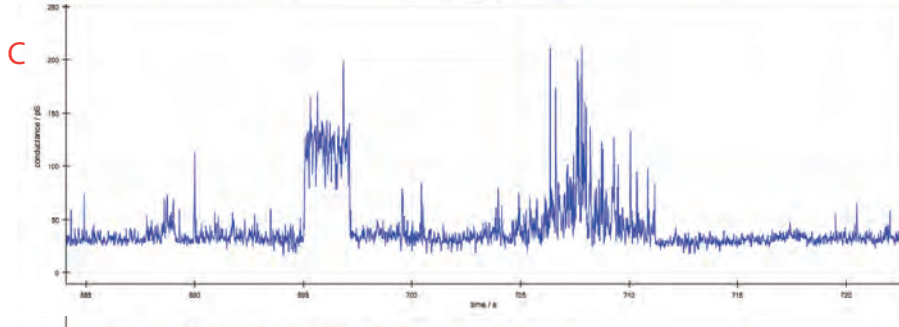
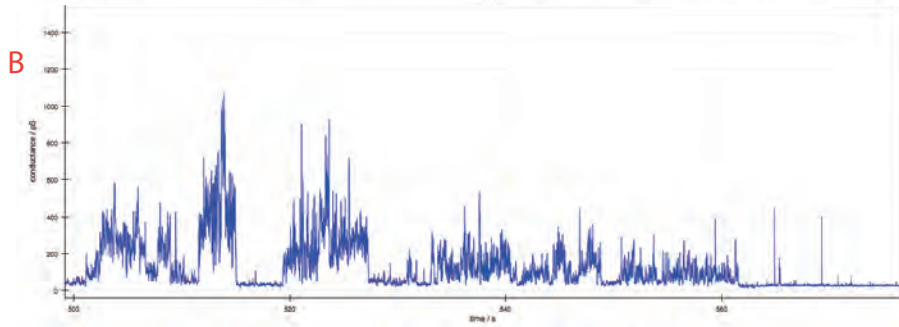
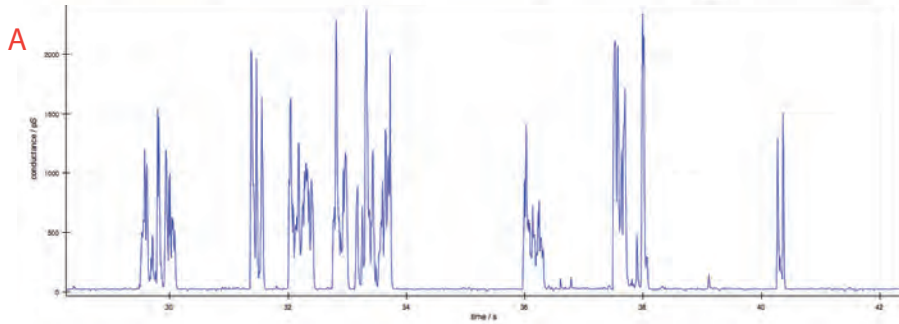
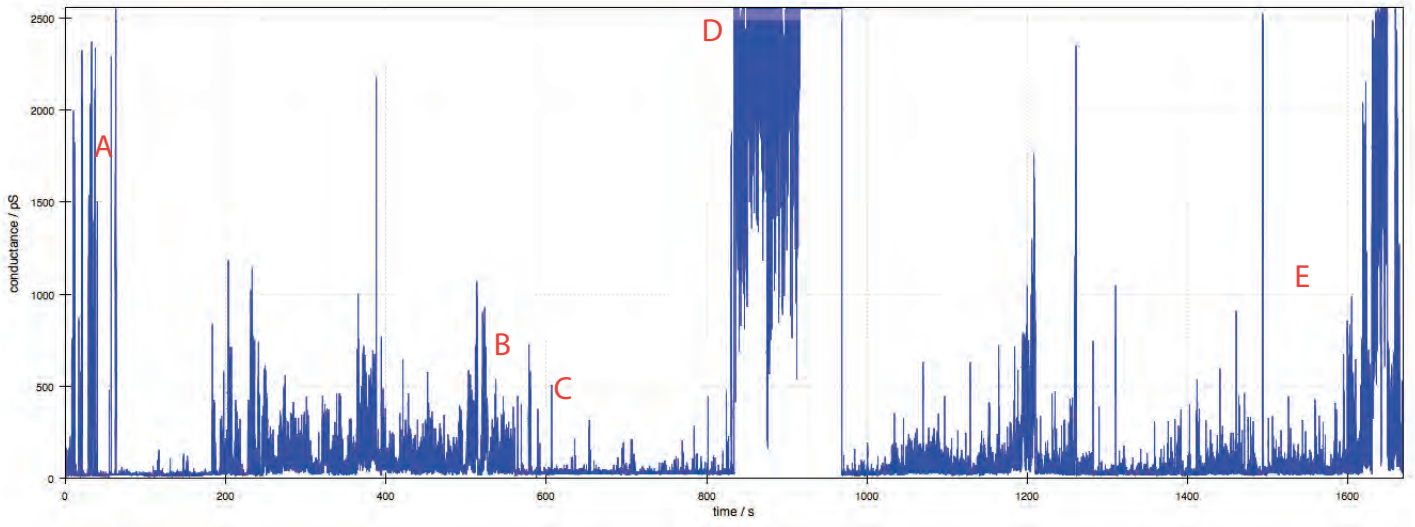


70-0001

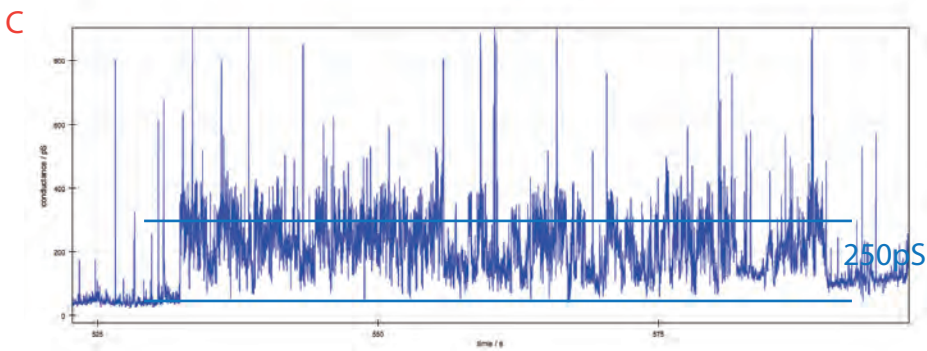
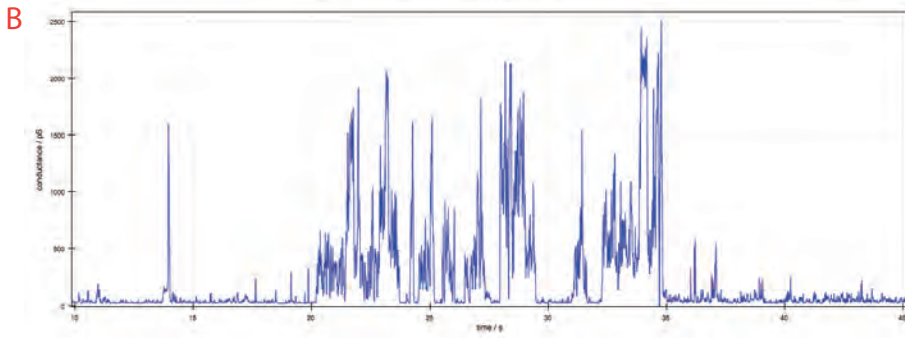
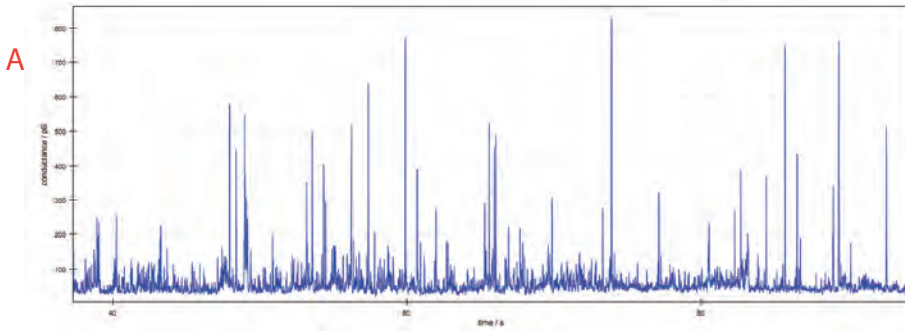
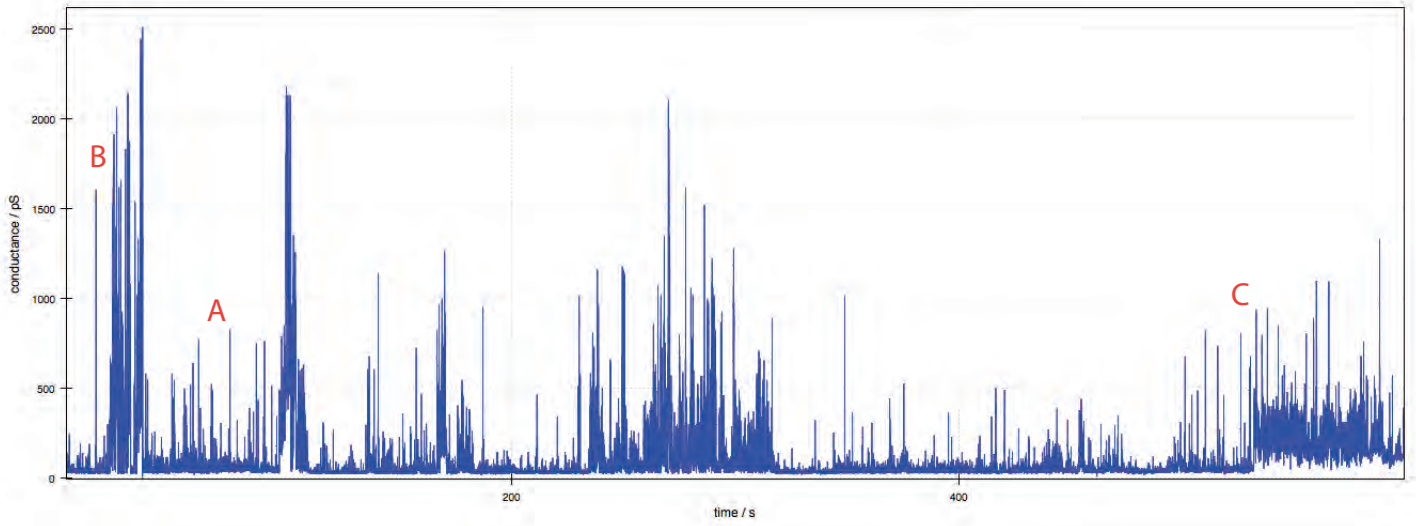


Not clear what is being looked at here.

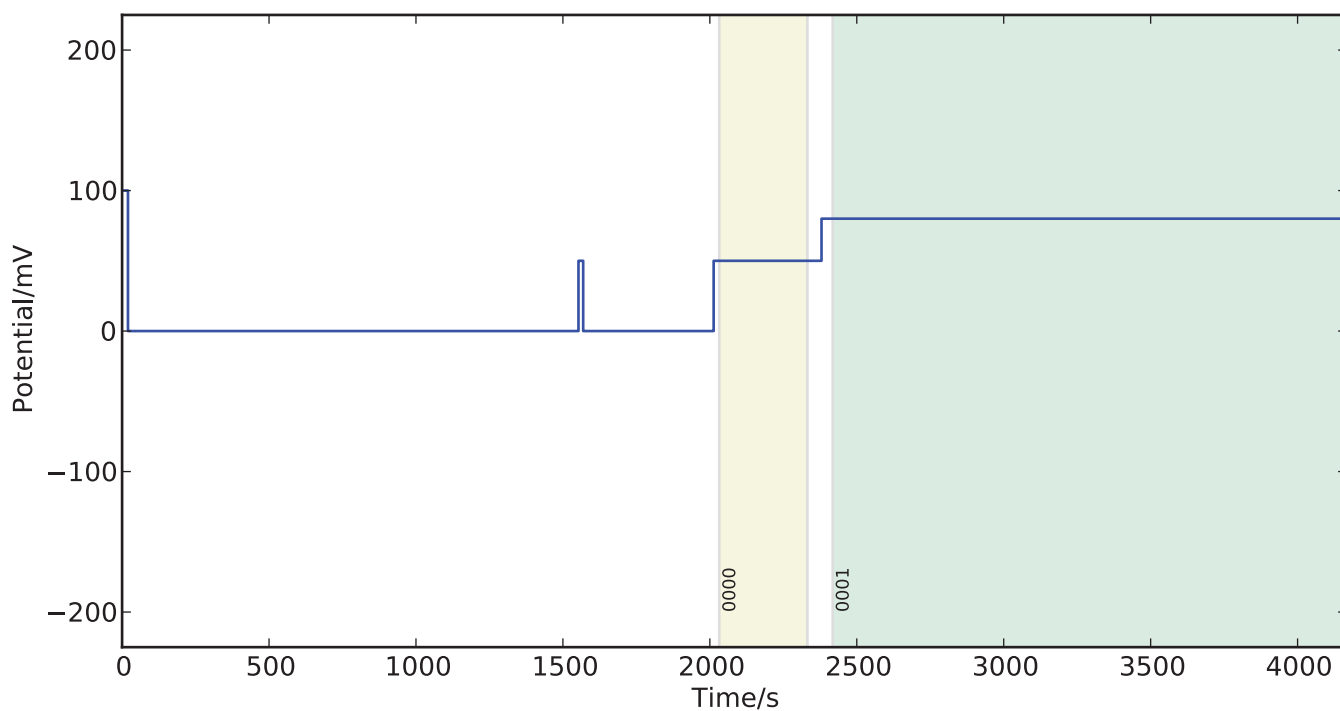




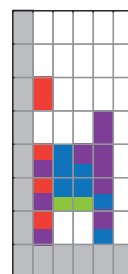
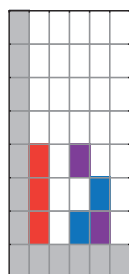
70-0003



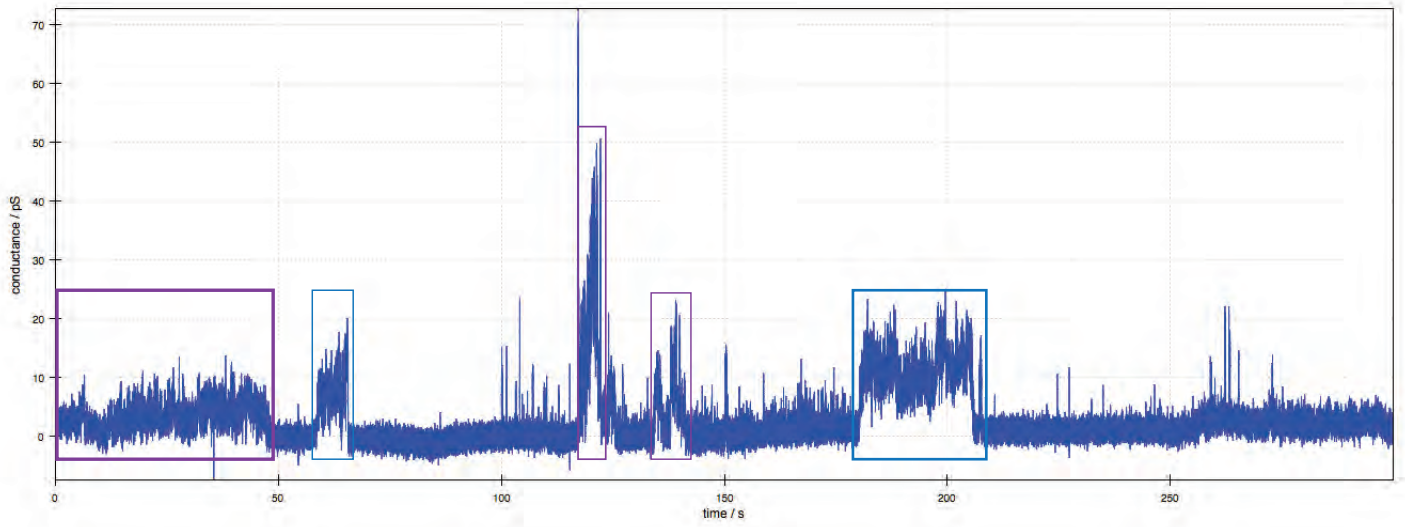
[JC-78] bCD6Es4 1M CsCl pH 7 homoAdd



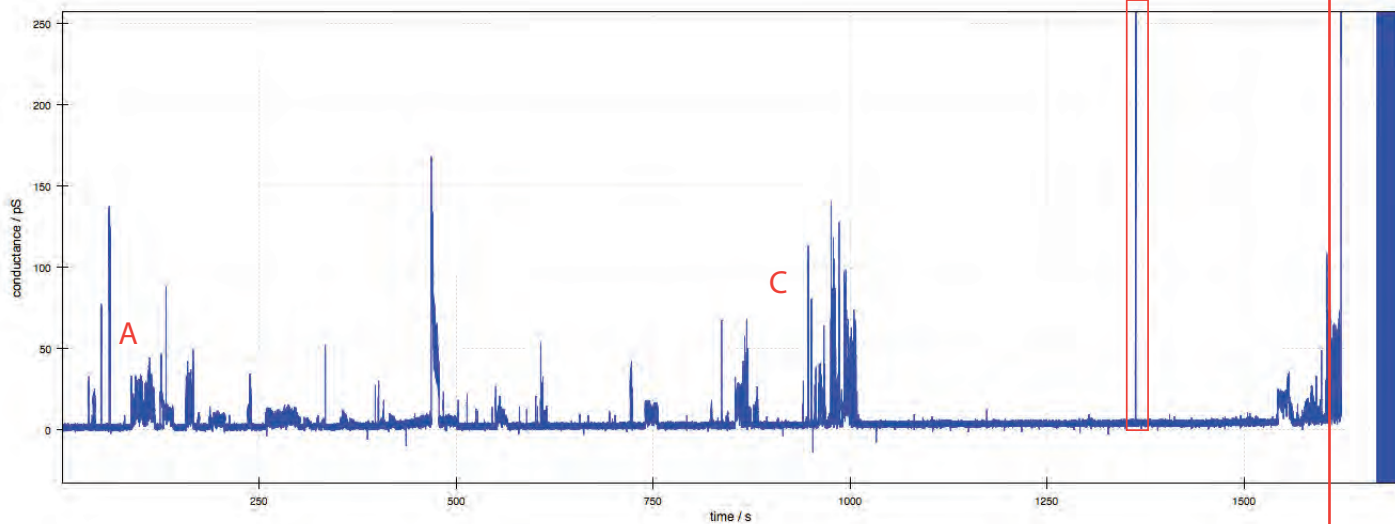
lipid
electrolyte 24/16uM
contact injection
brush transfer



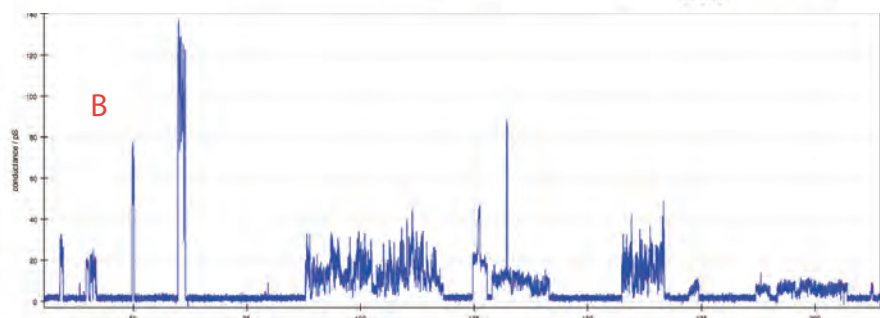
78-0000



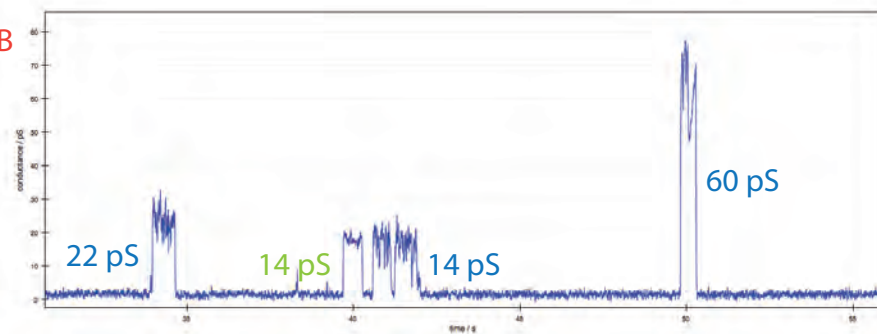
78-0001



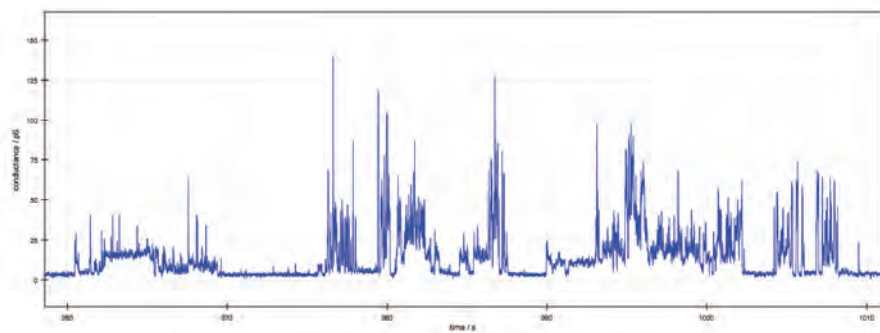
A



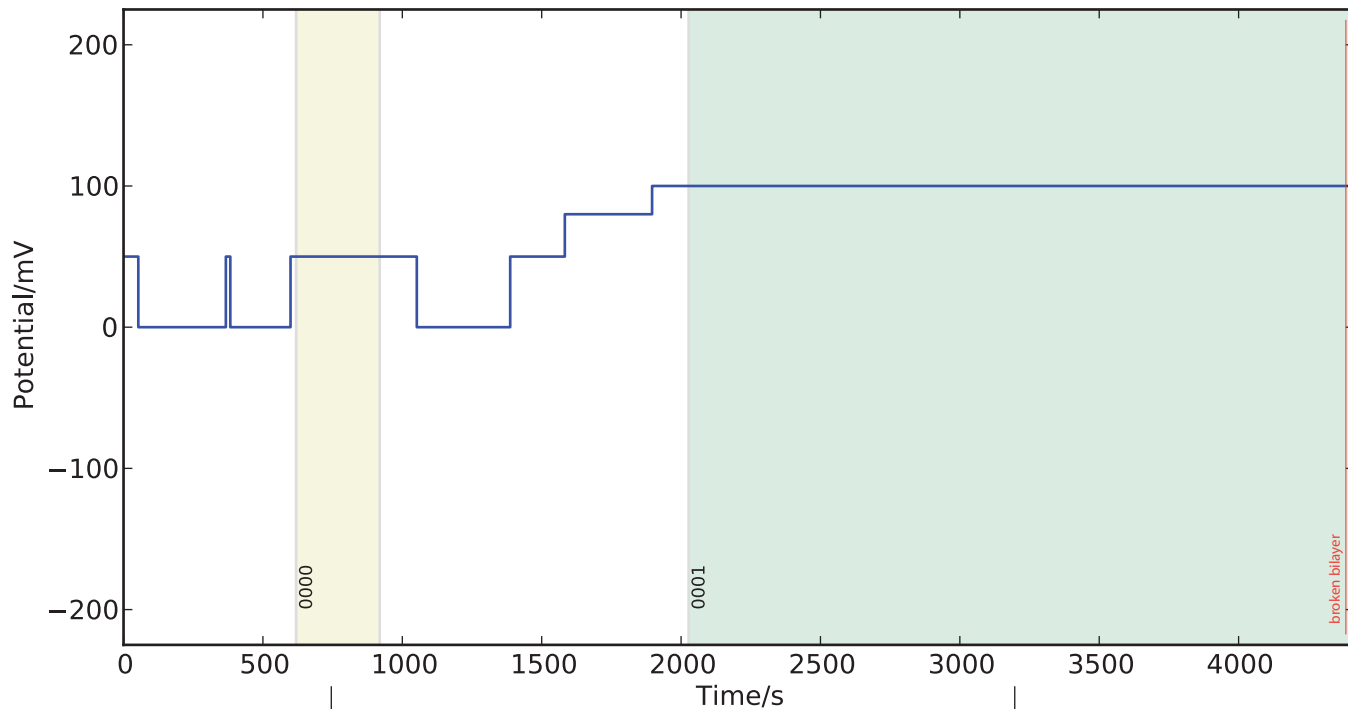
B



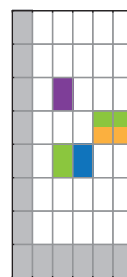
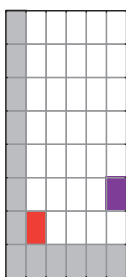
C



[JC-89] bCD6Es4 1M CsCl pH 7 homoAdd (5-newDiPhPC)

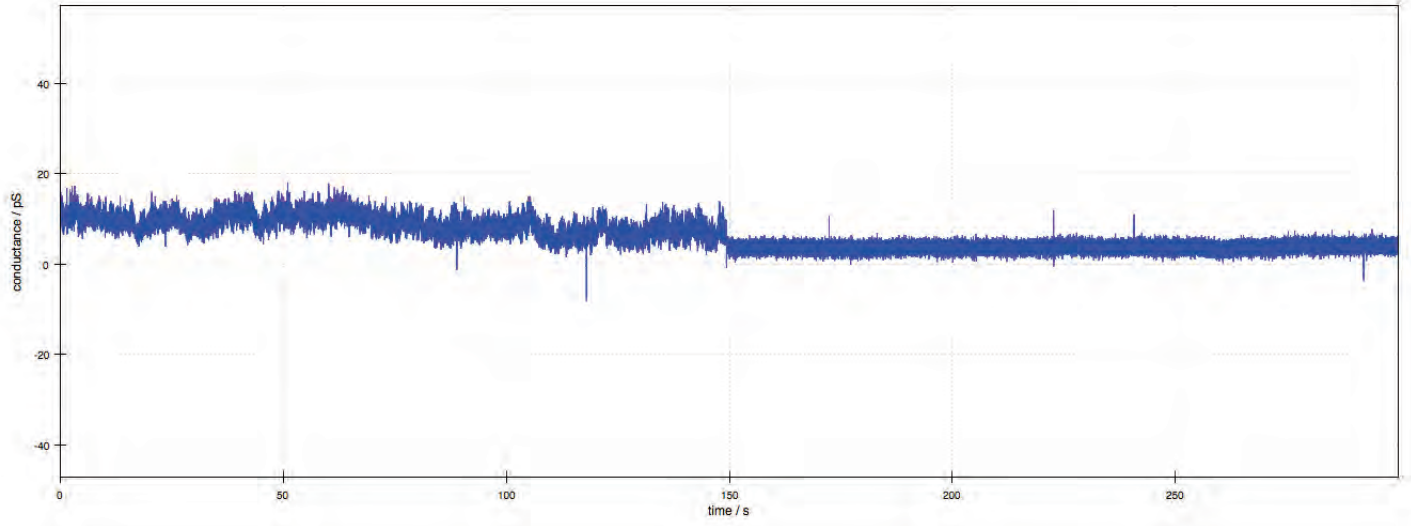


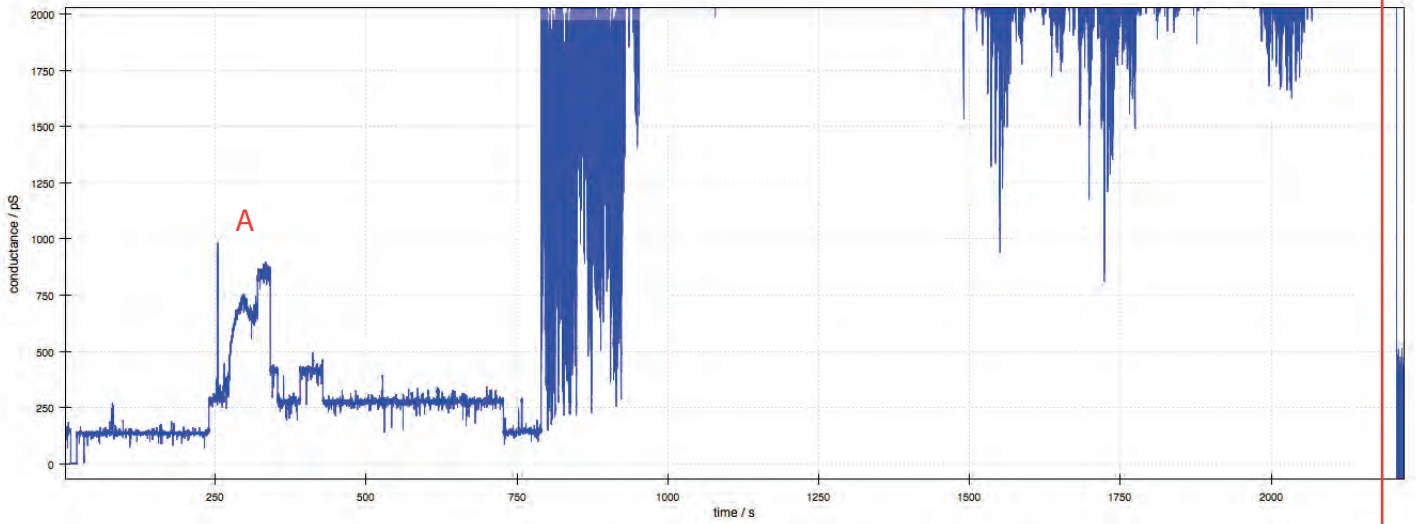
lipid
 electrolyte 26/17.5uM
 contact injection
 brush transfer



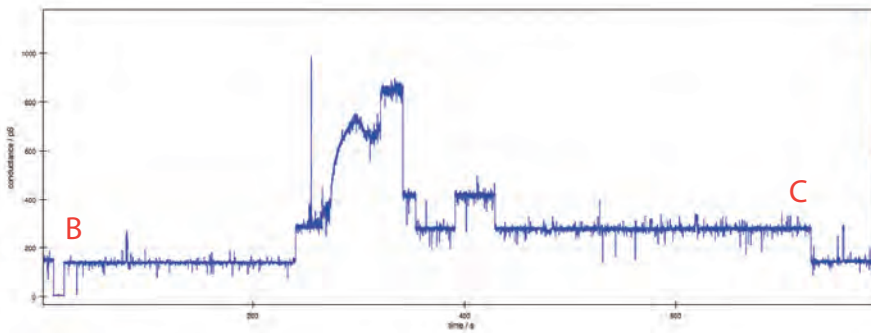
uncategorized curvy opening

89-0000



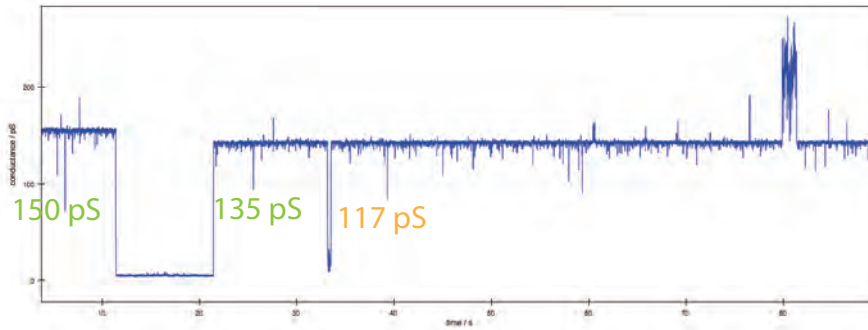


A

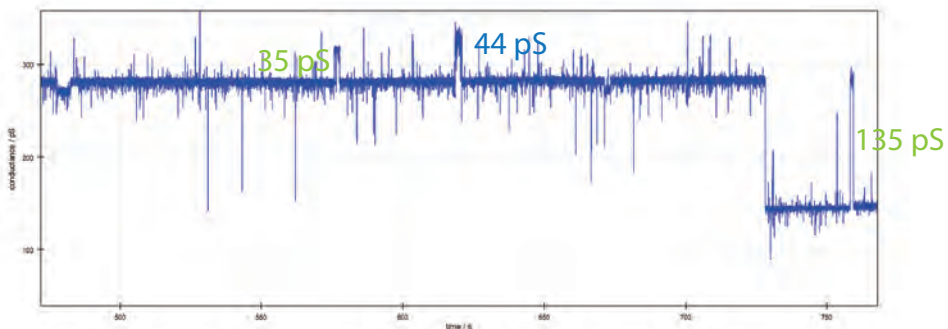


Note the lack of downward deflection at the true baseline

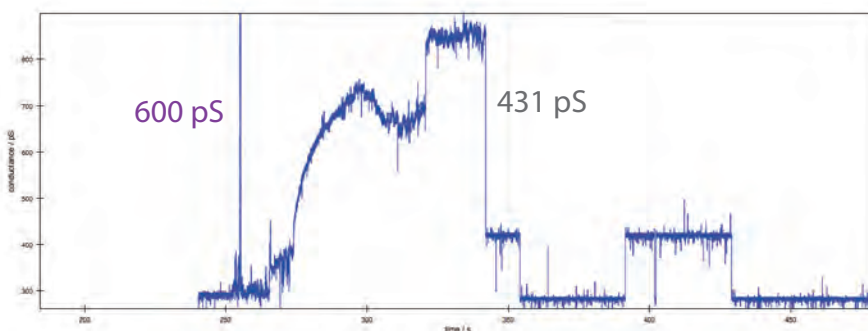
B



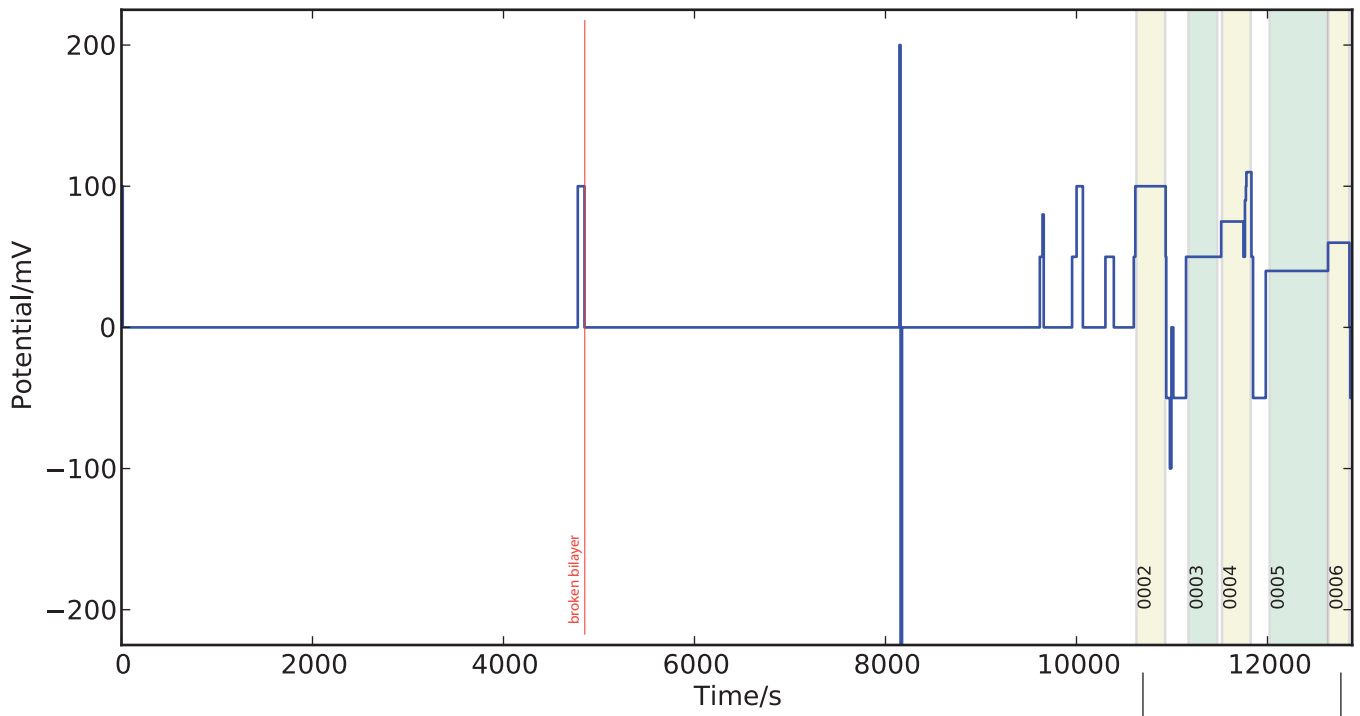
C



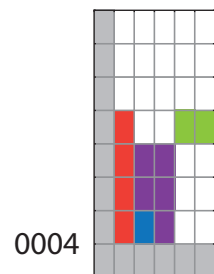
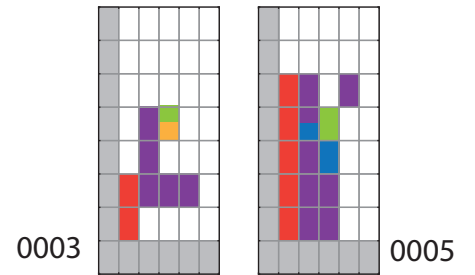
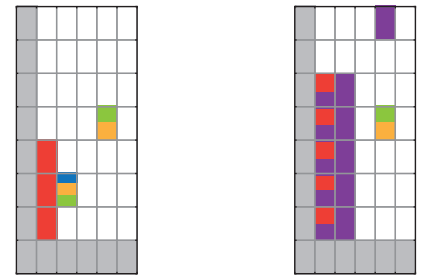
D



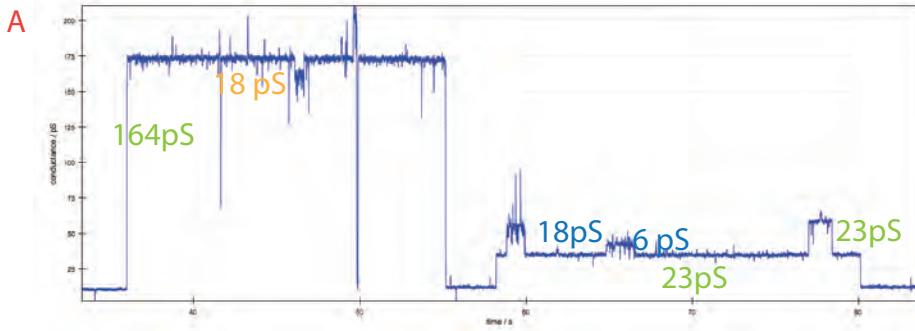
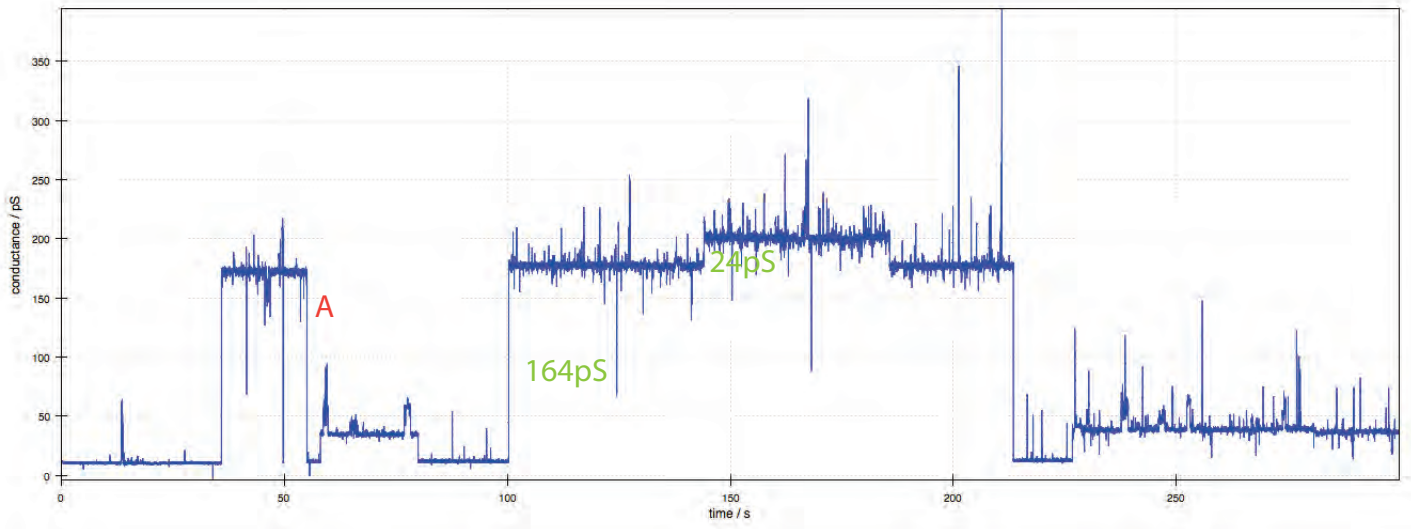
[JC-91] bCD6Es4 1M CsCl pH 7 homoAdd (5-newDiPhPC) (2)



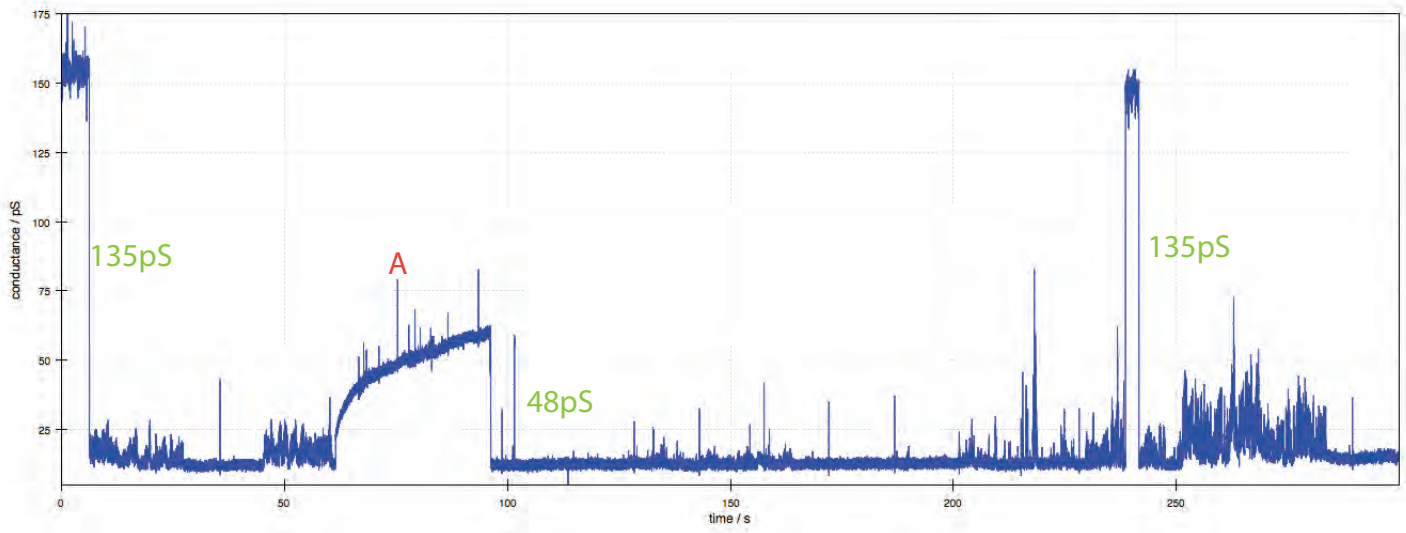
lipid
electrolyte
contact injection
brush transfer



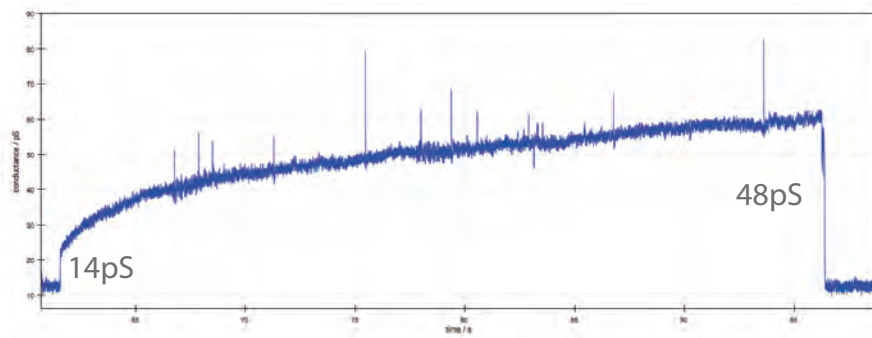
91-0002



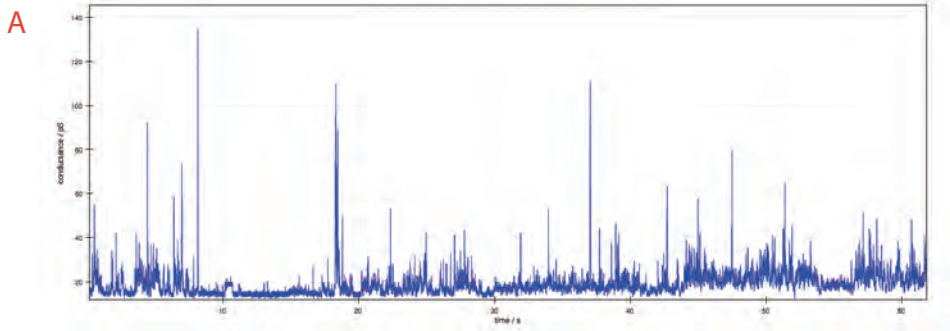
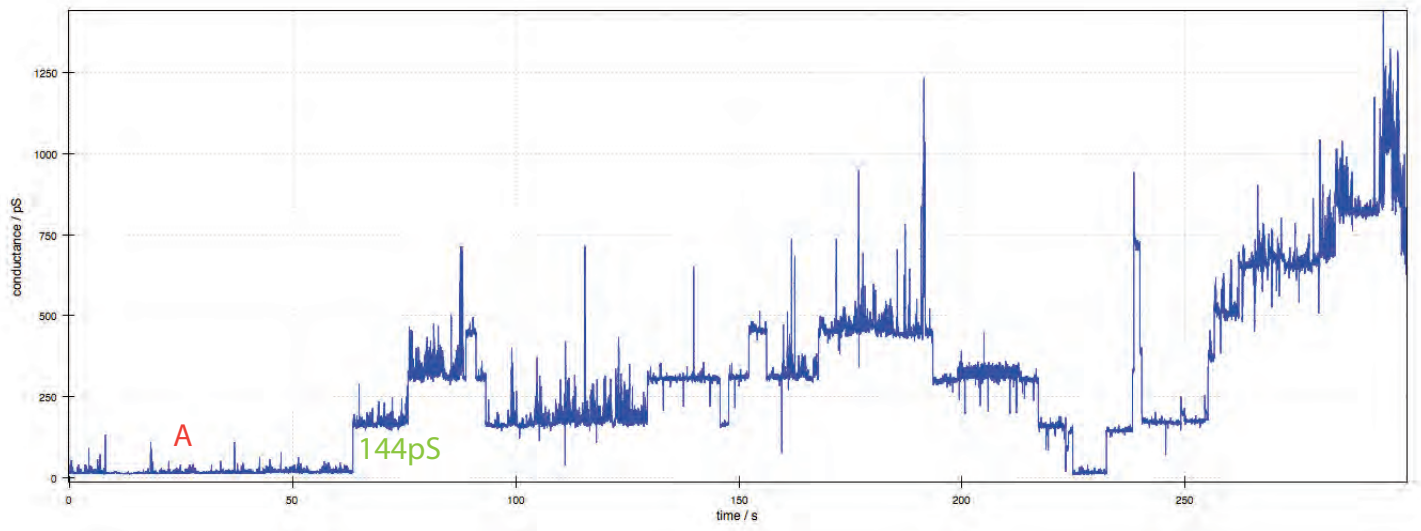
91-0003



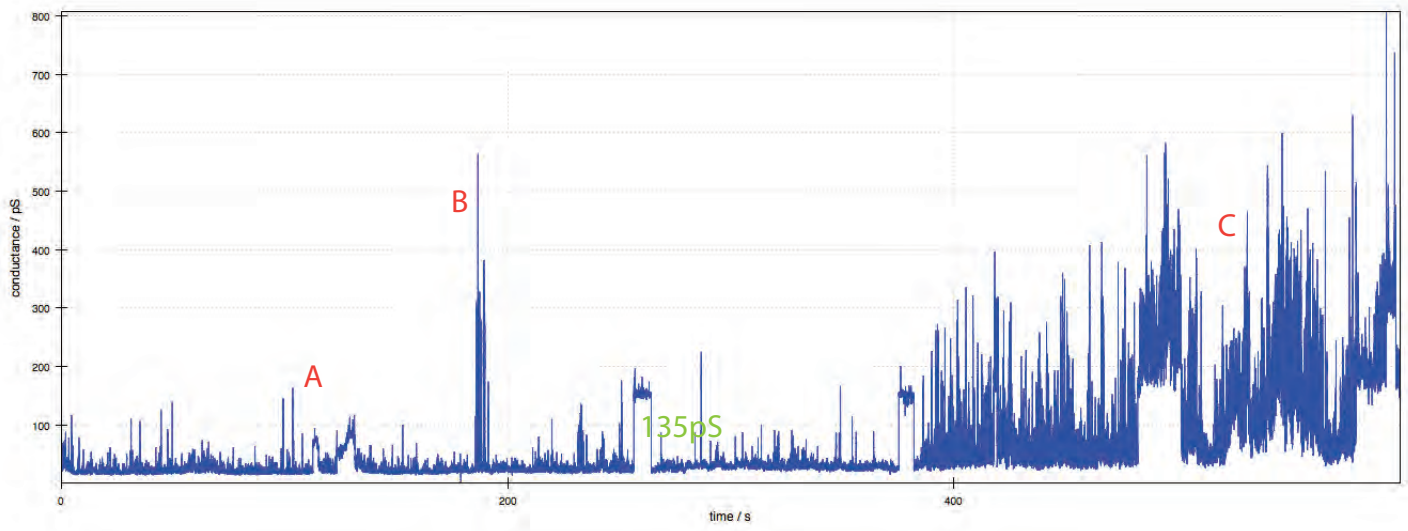
A



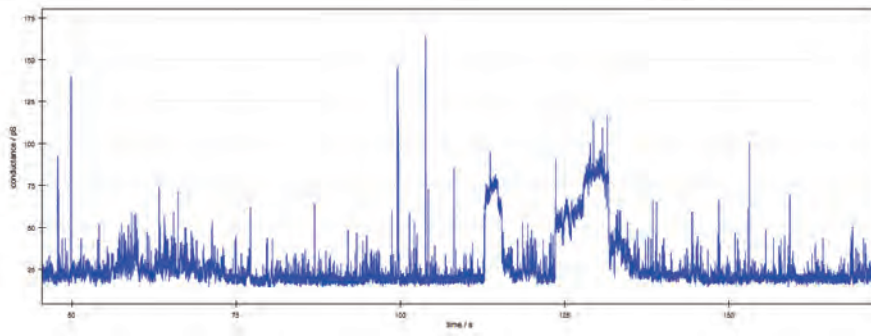
91-0004



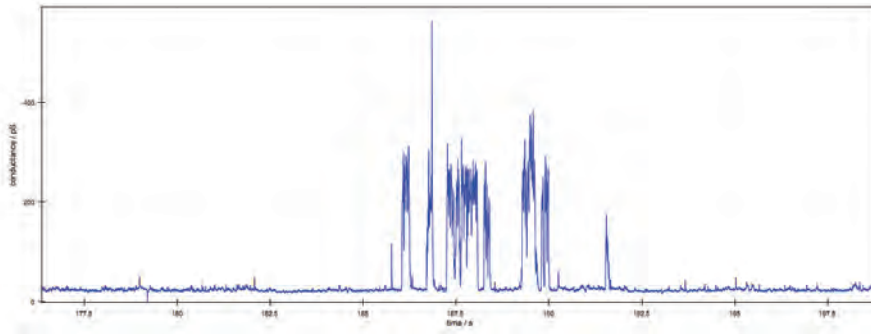
91-0005



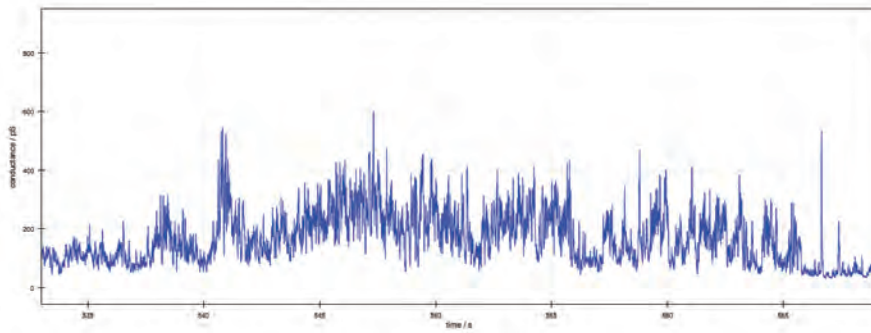
A



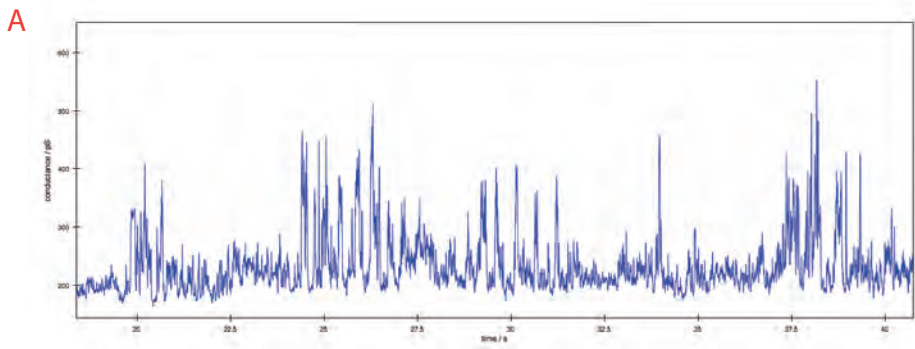
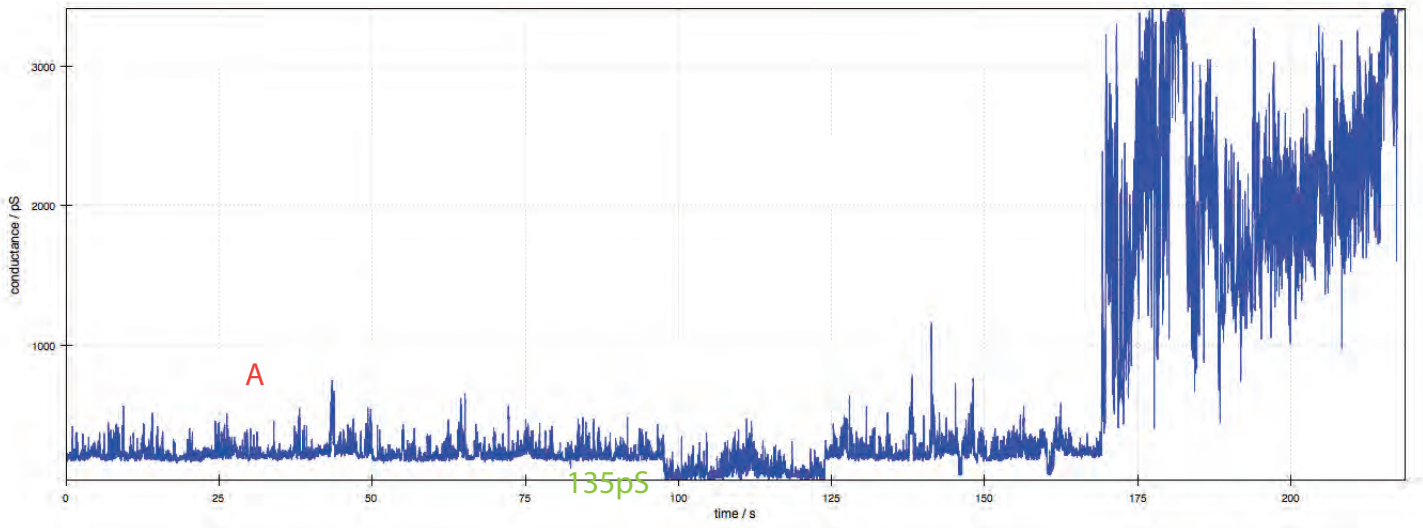
B



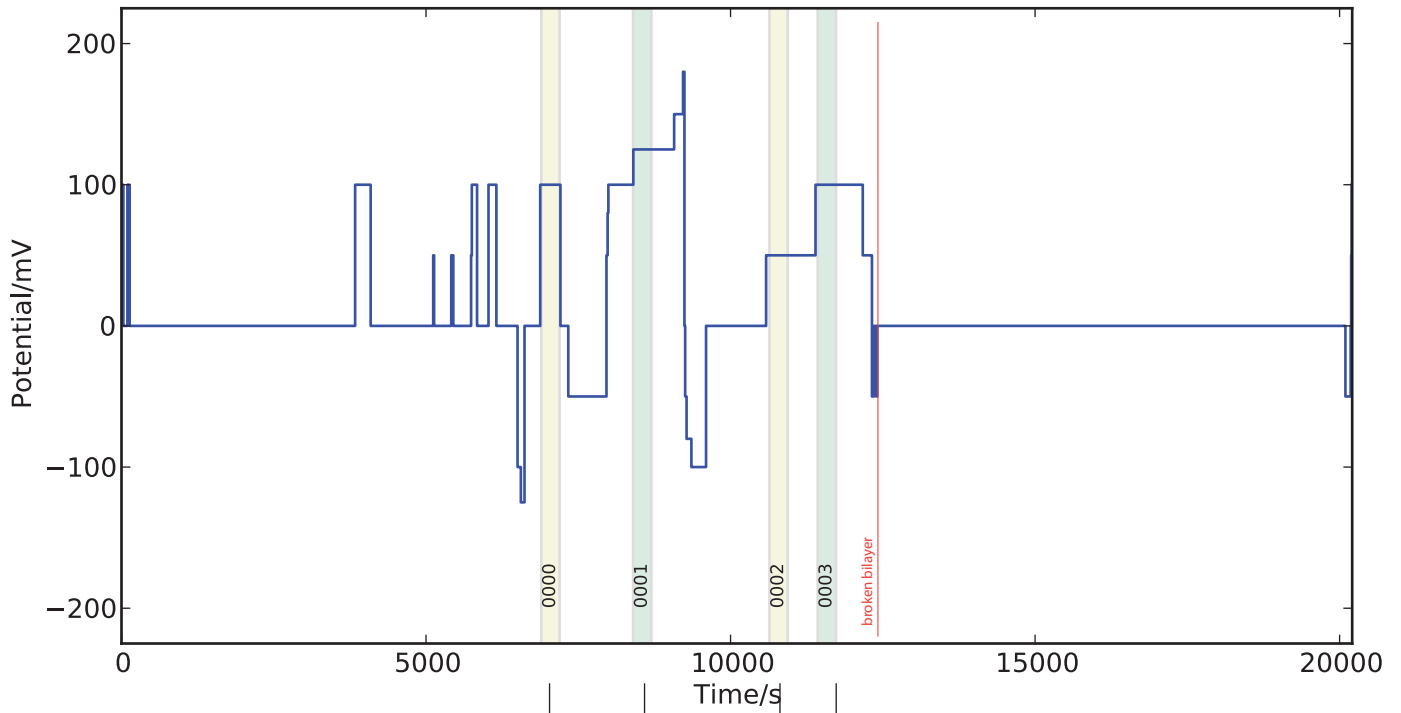
C



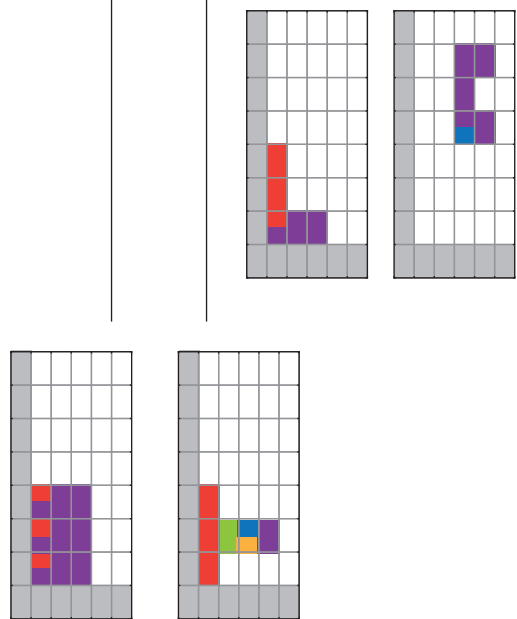
91-0006



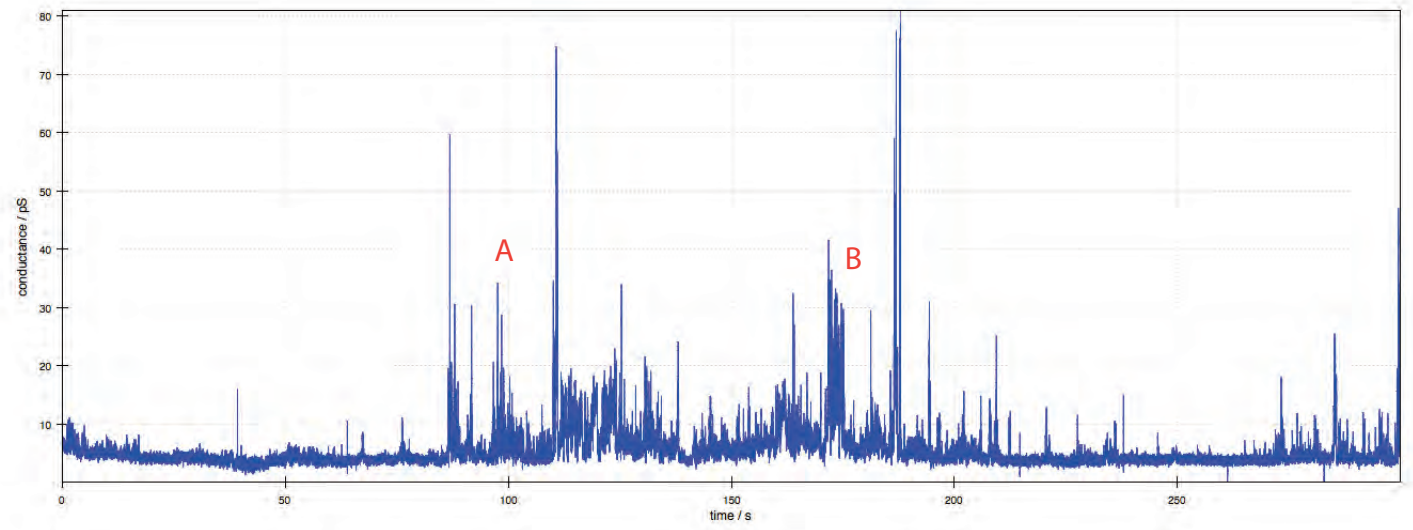
[JC-92] bCD6Es4 1M KCl pH 7 homoAdd (newDiPhPC)



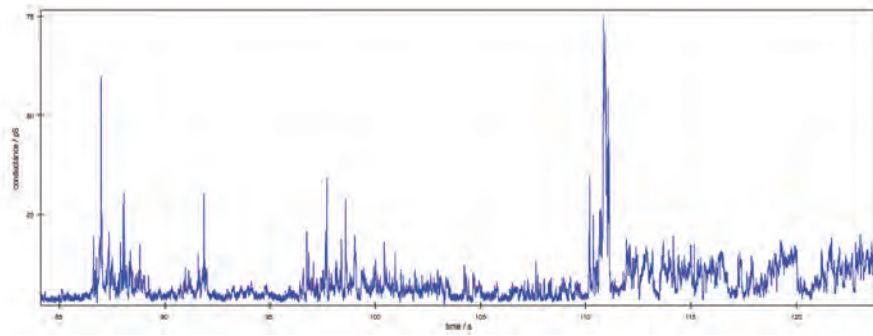
lipid
electrolyte 17.8/26.6uM
contact injection
brush transfer



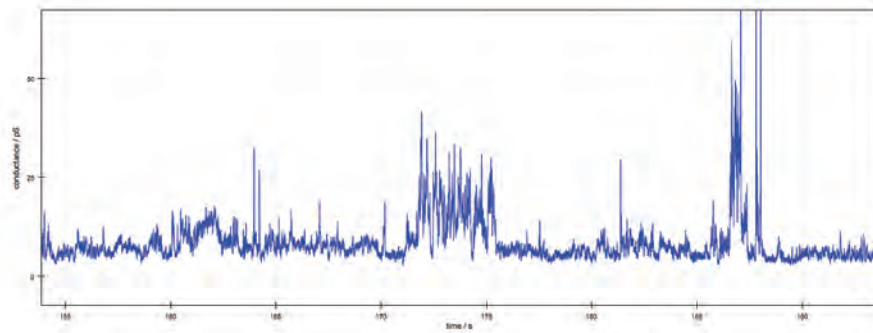
92-0000



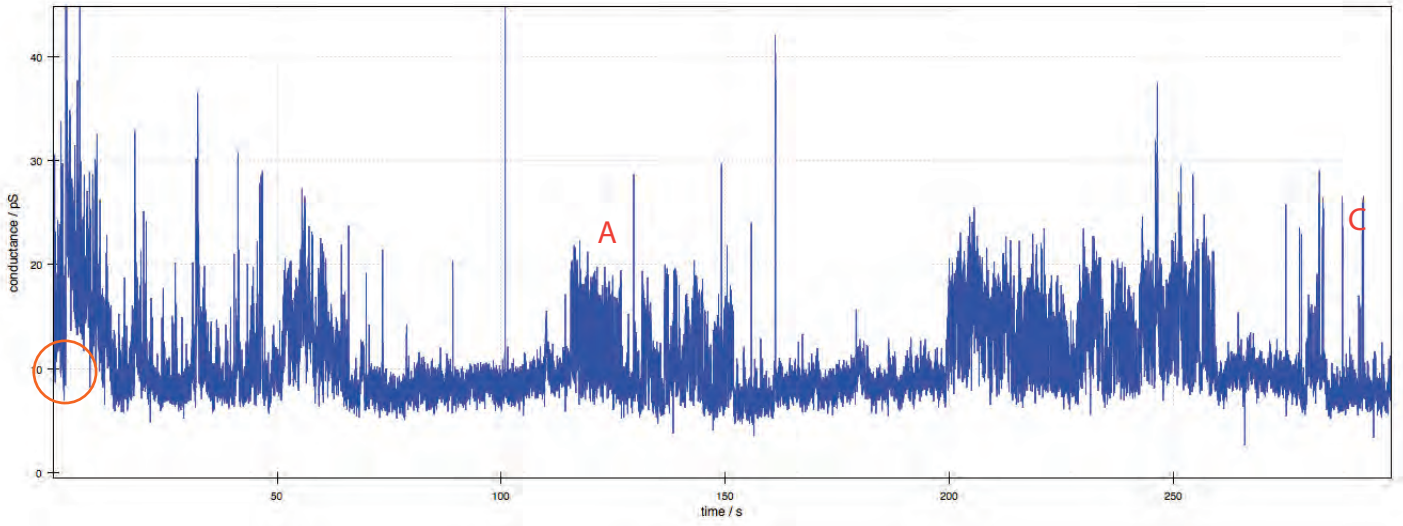
A



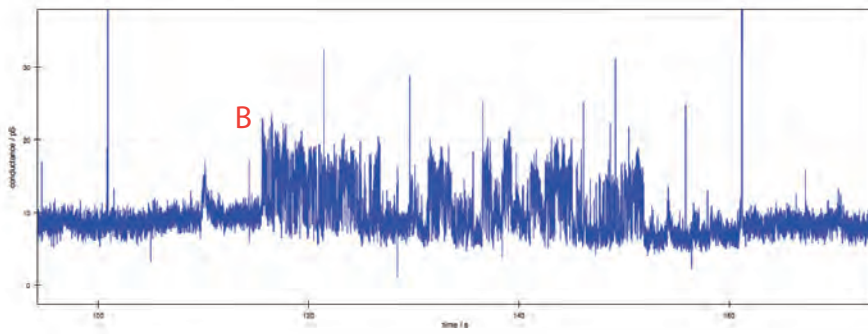
B



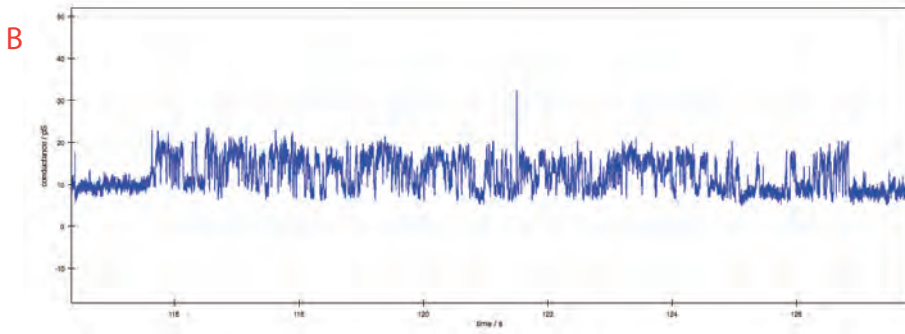
92-0001



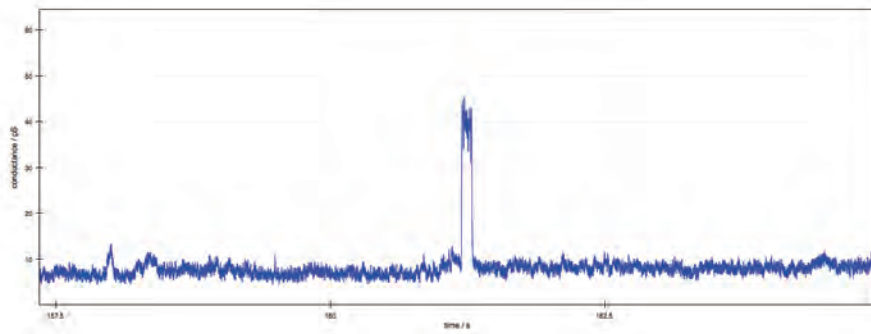
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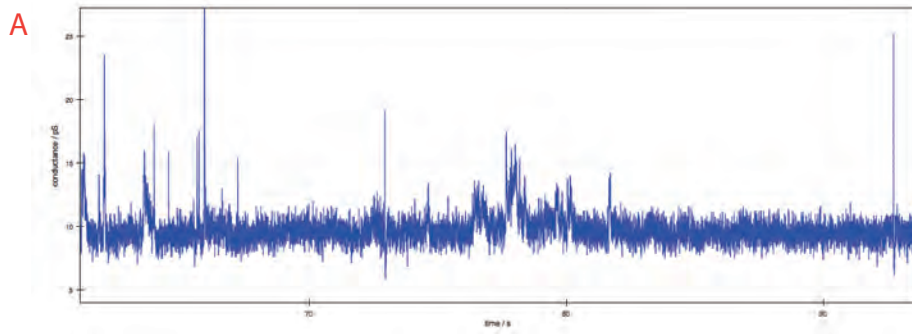
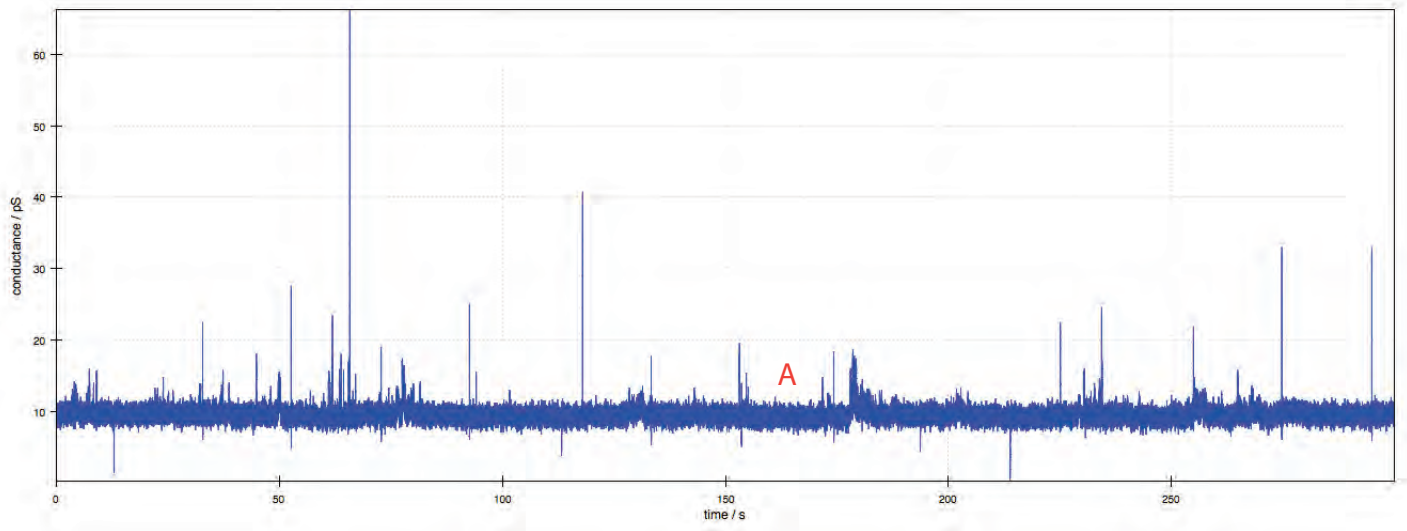
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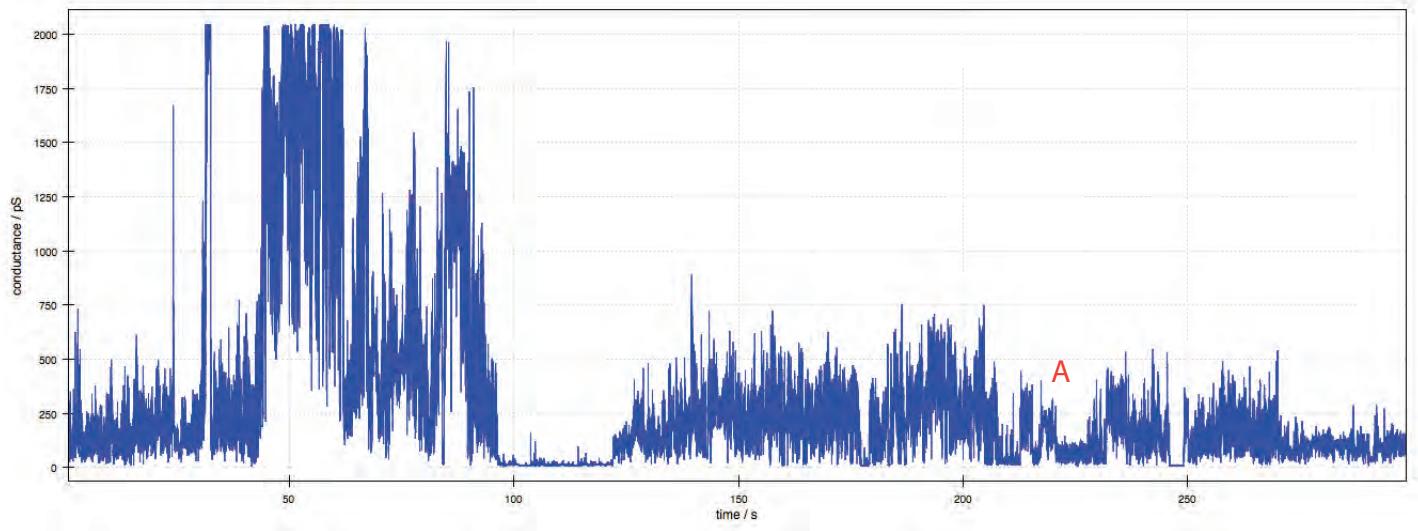
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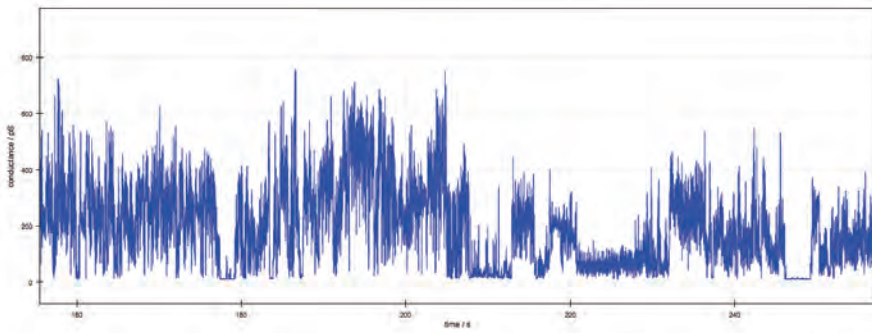
92-0002



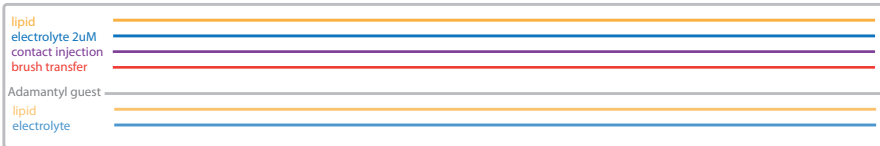
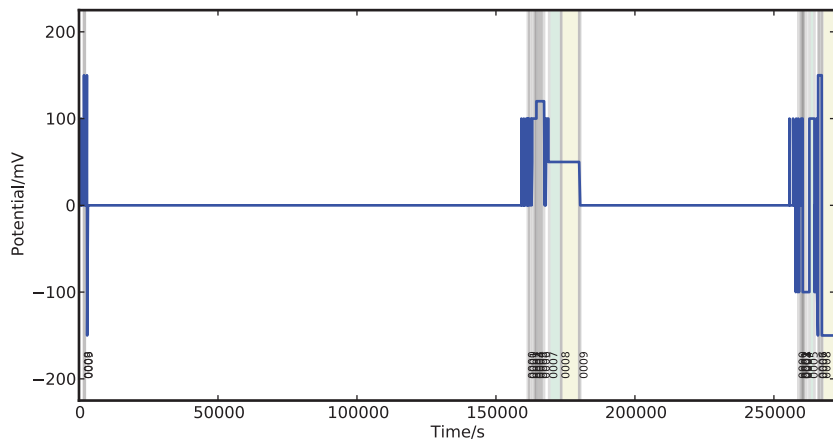
92-0003



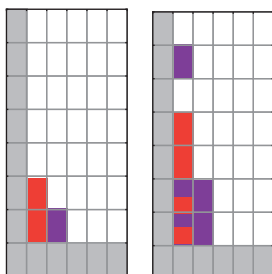
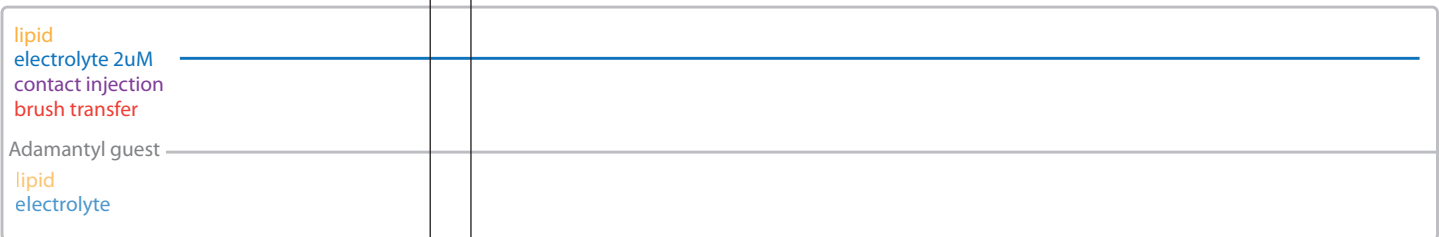
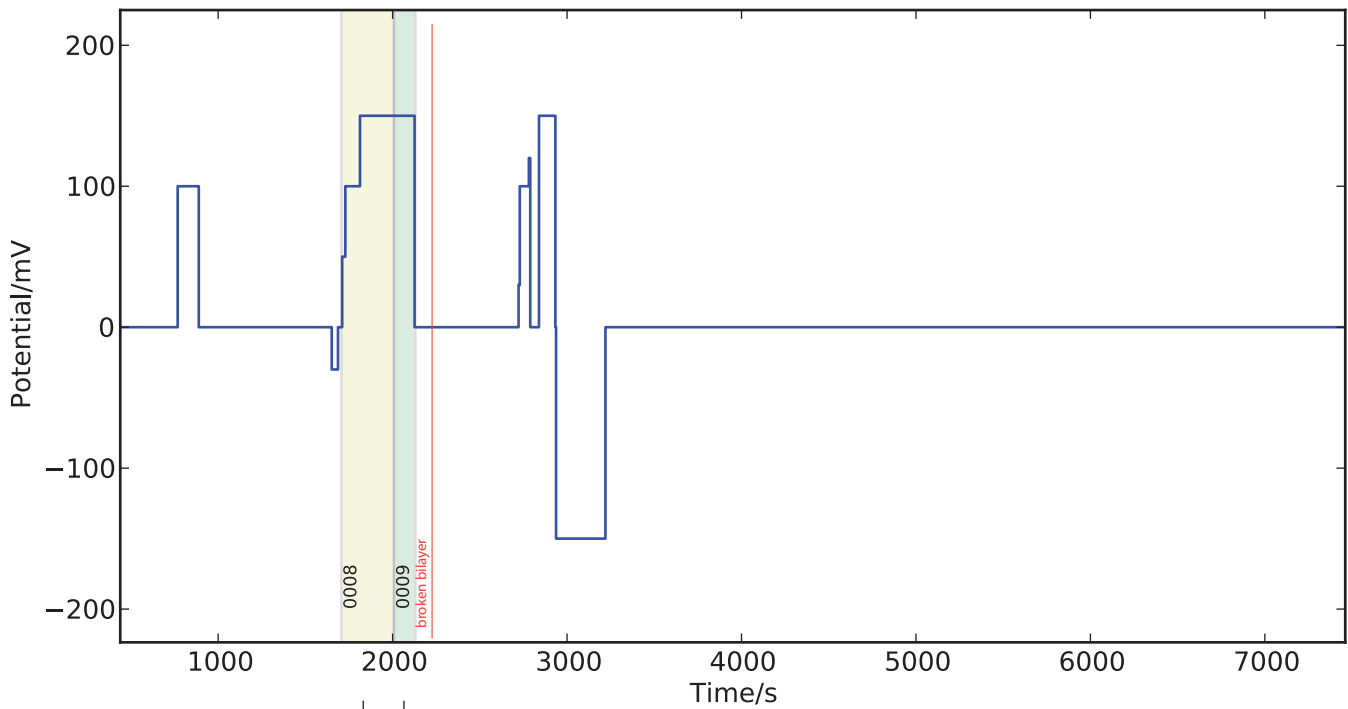
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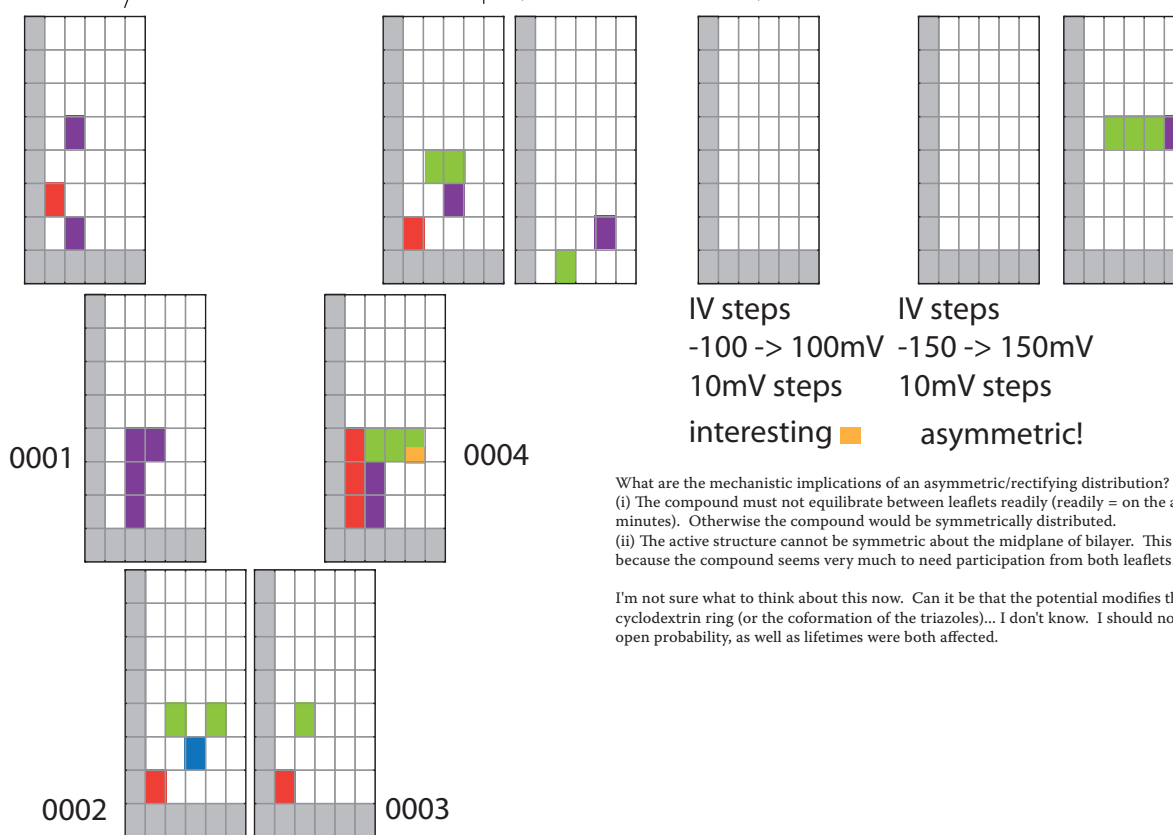
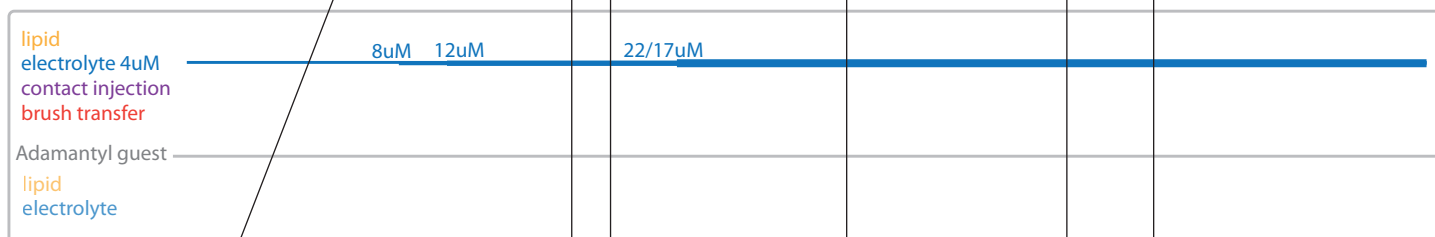
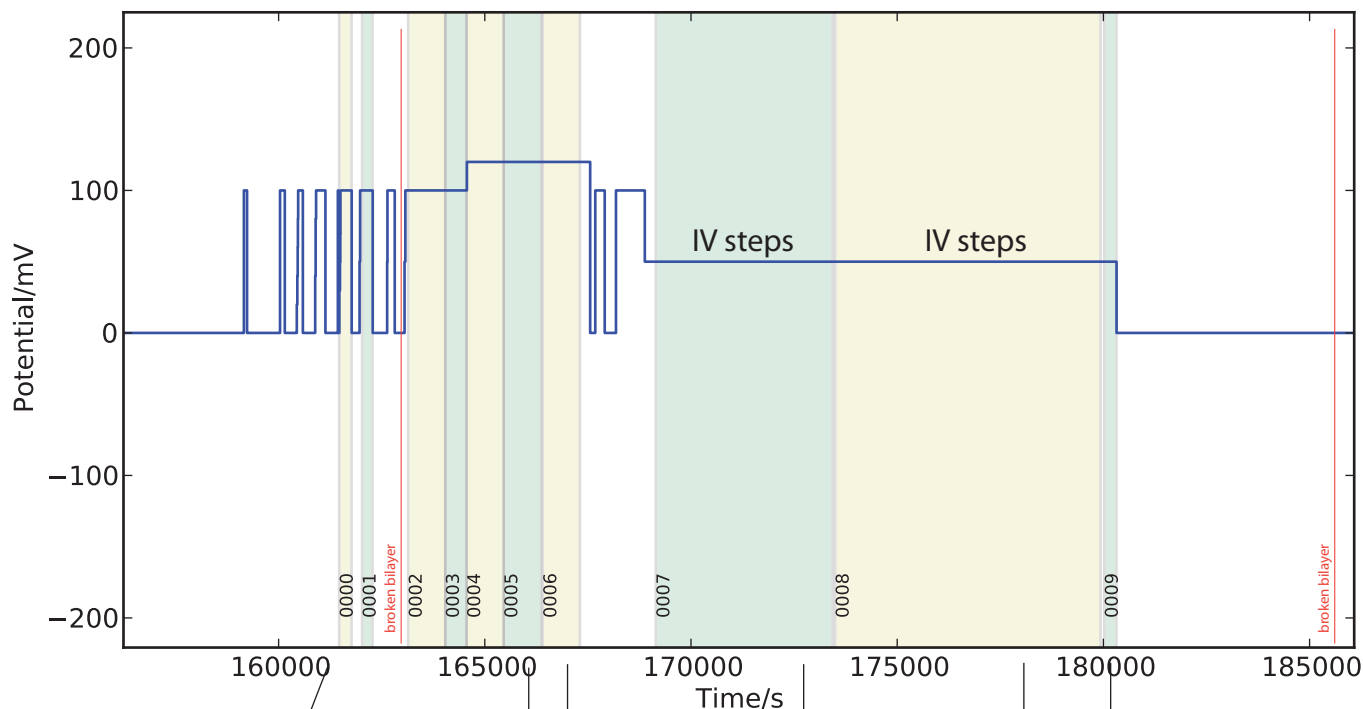
[JC-64] bCD-6NH4 - 1M CsCl unbuffered 2uM



[JC-64] bCD-6NH4 - 1M CsCl unbuffered 2uM



[JC-64] bCD-6NH4 - 1M CsCl unbuffered 2uM

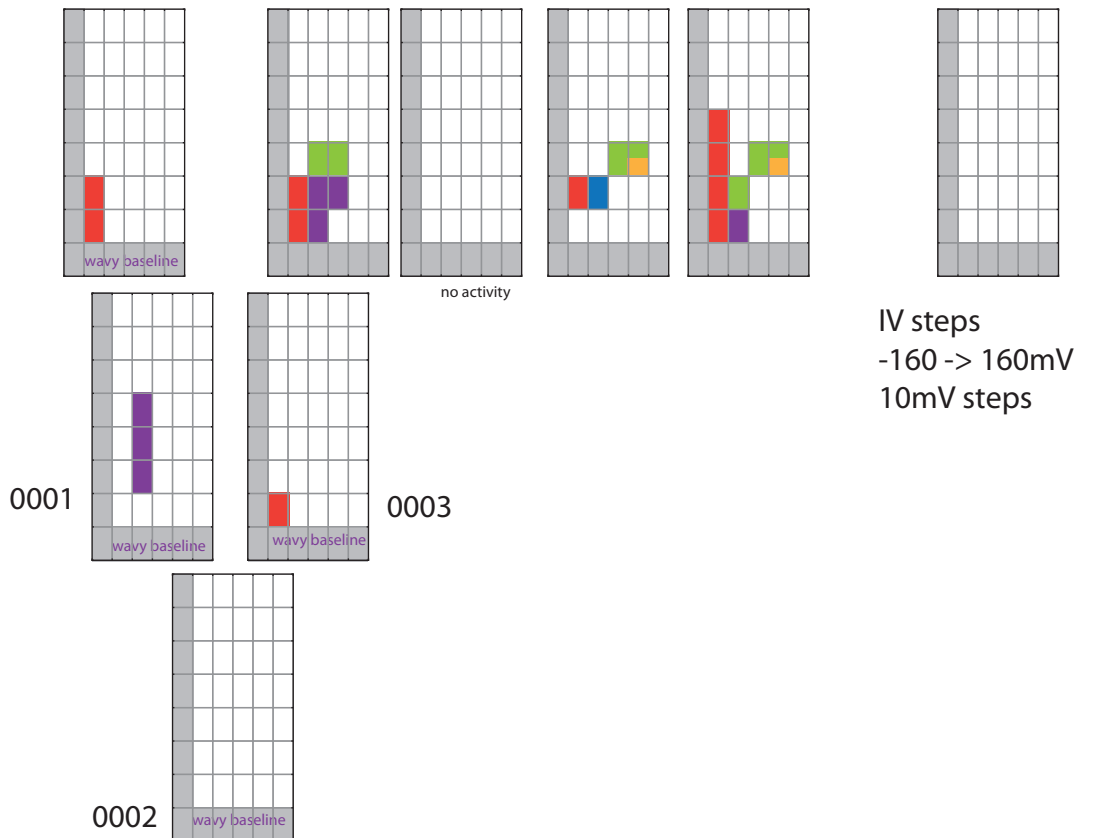
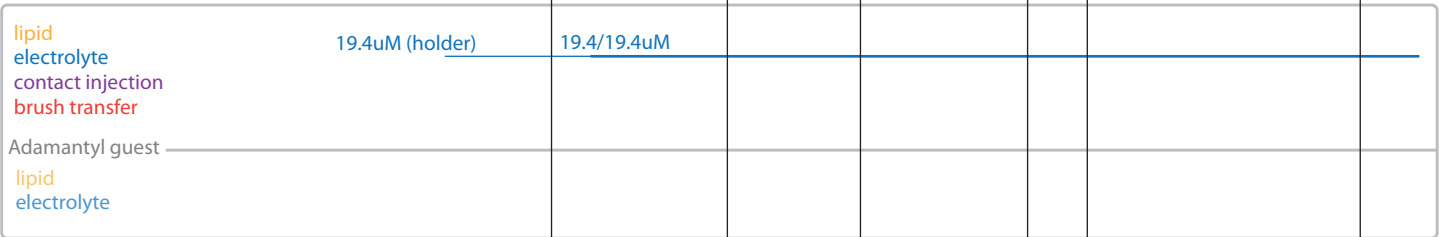
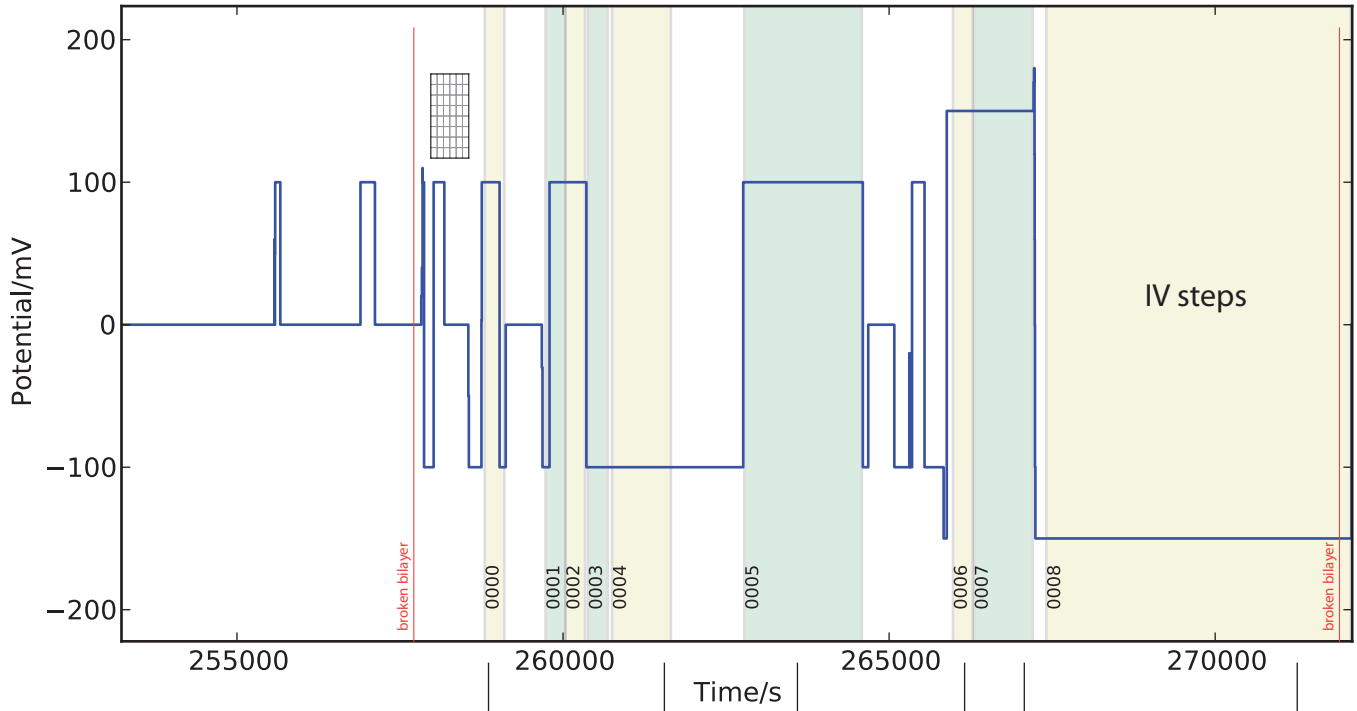


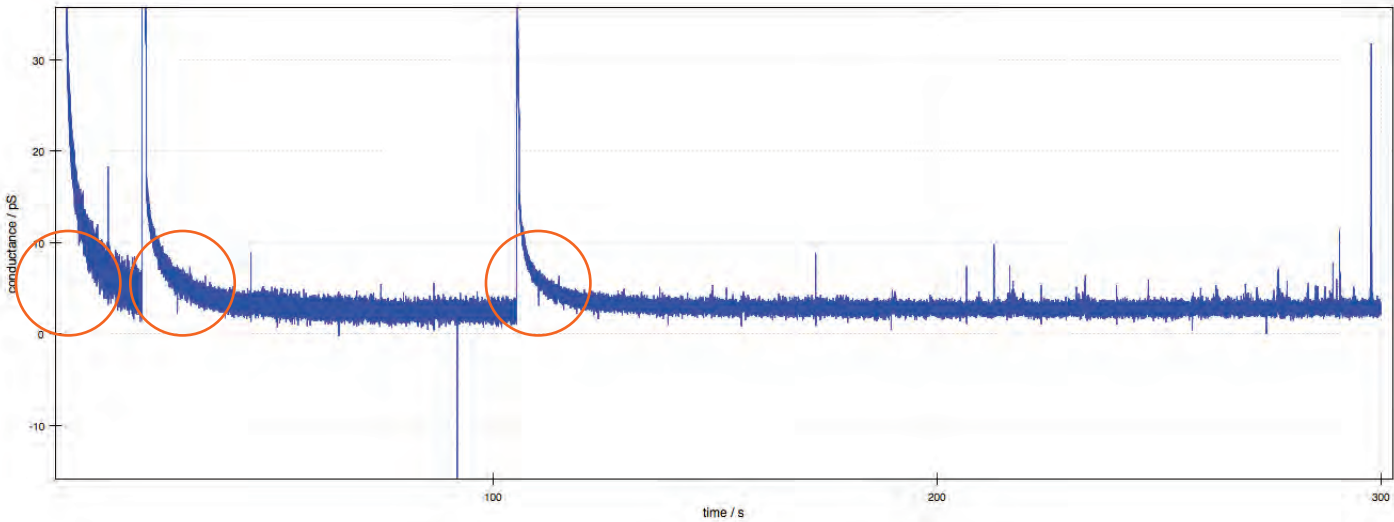
IV steps -100 -> 100mV -150 -> 150mV
 10mV steps 10mV steps
 interesting ■ asymmetric!

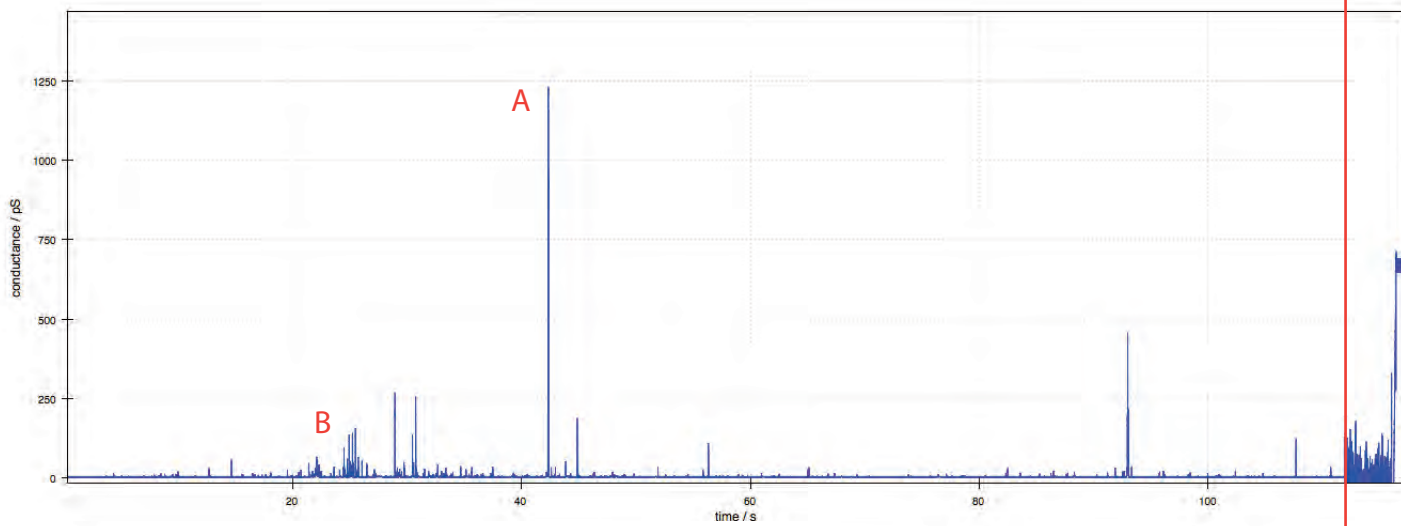
What are the mechanistic implications of an asymmetric/rectifying distribution?
 (i) The compound must not equilibrate between leaflets readily (readily = on the analysis timescale = minutes). Otherwise the compound would be symmetrically distributed.
 (ii) The active structure cannot be symmetric about the midplane of bilayer. This is weird to think about, because the compound seems very much to need participation from both leaflets.

I'm not sure what to think about this now. Can it be that the potential modifies the penetration of the cyclodextrin ring (or the conformation of the triazoles)... I don't know. I should note that seemingly the open probability, as well as lifetimes were both affected.

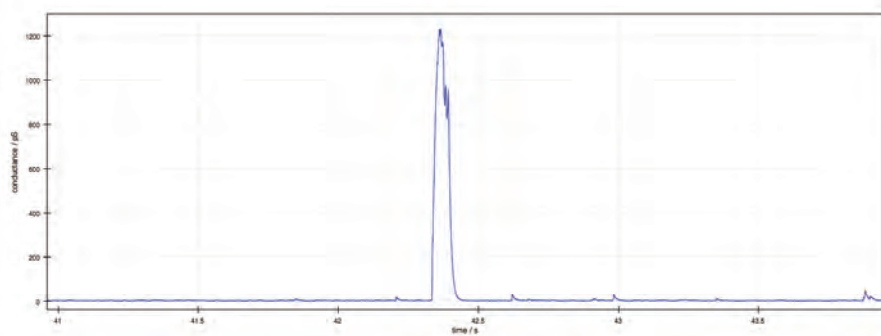
[JC-64] bCD-6NH4 - 1M CsCl unbuffered 2uM



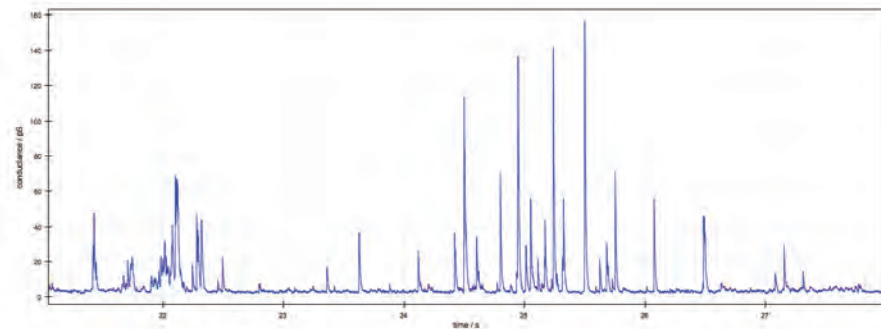


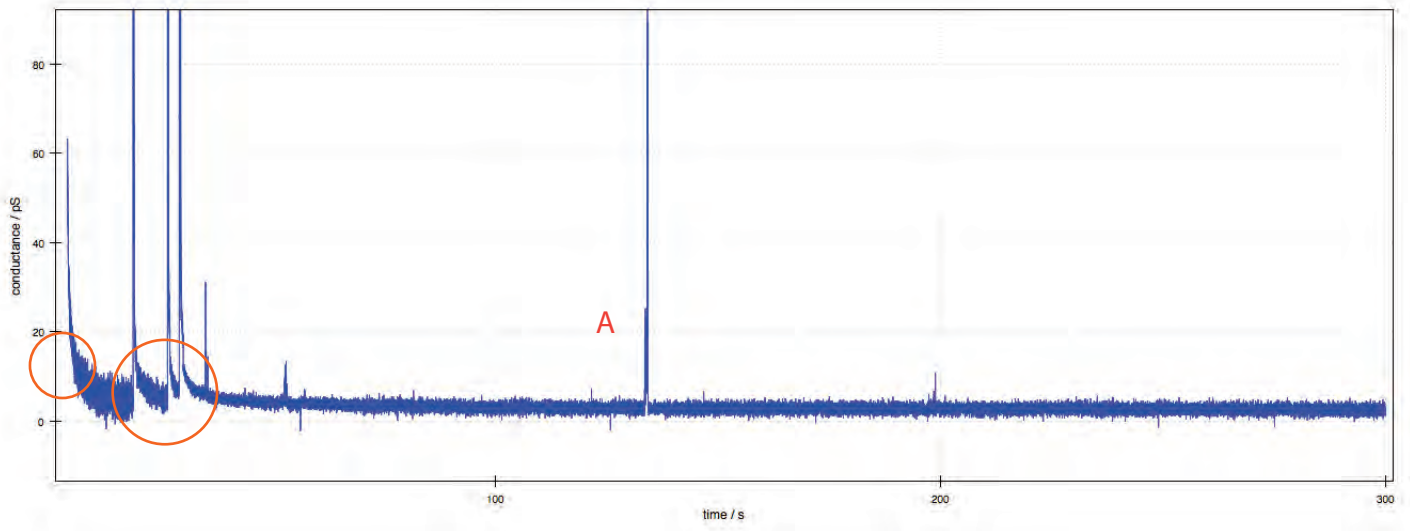


A

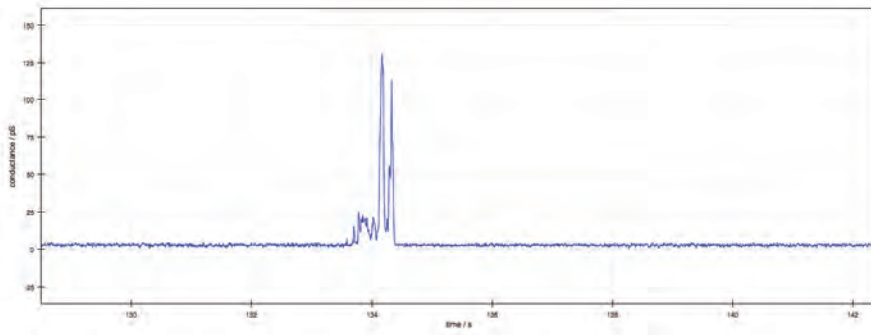


B

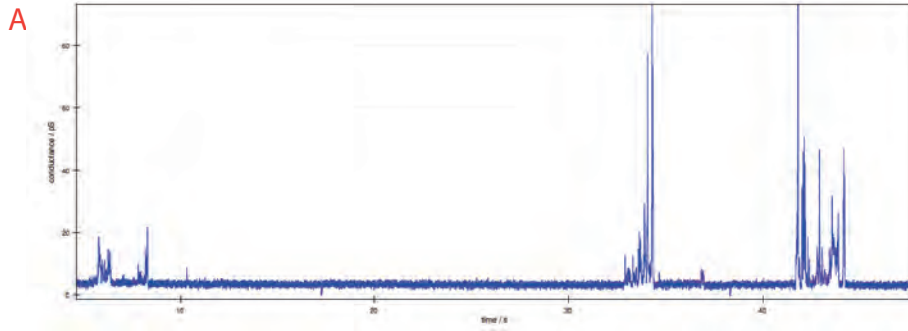
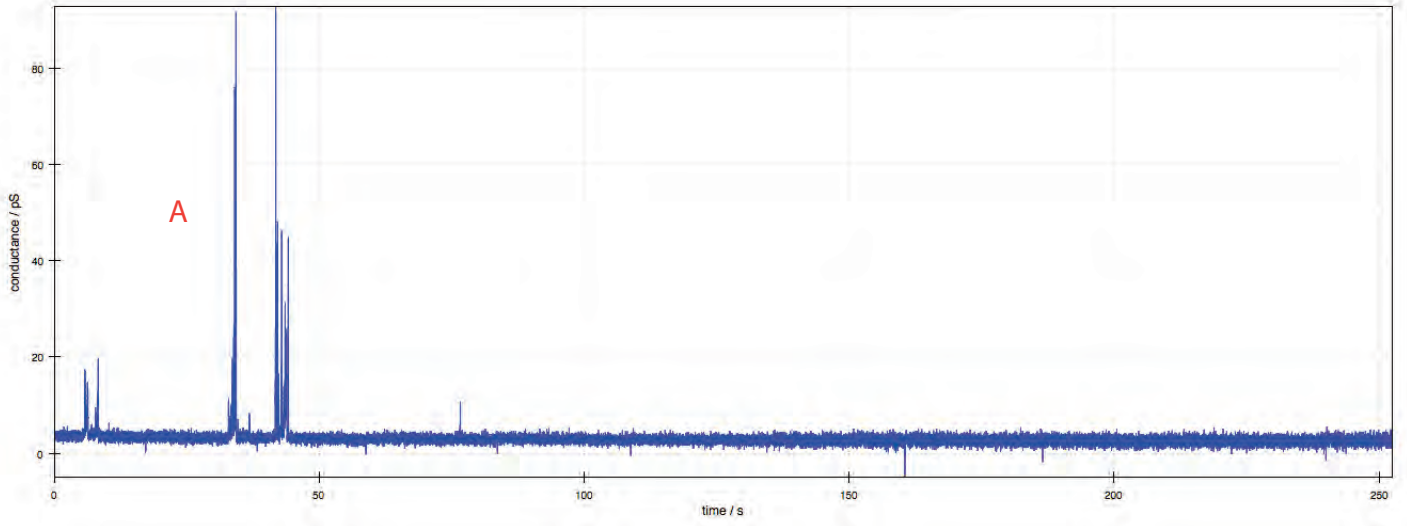


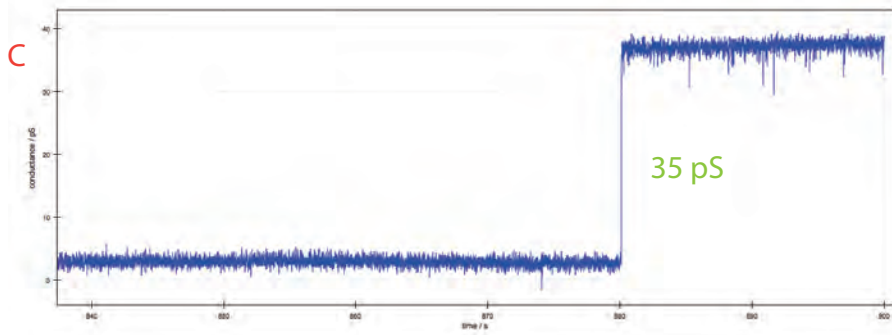
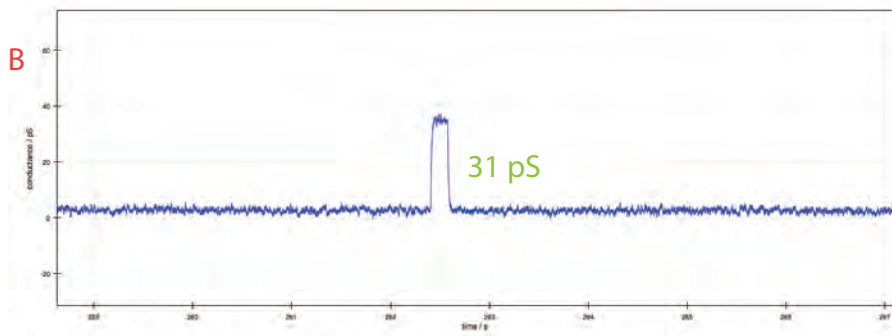
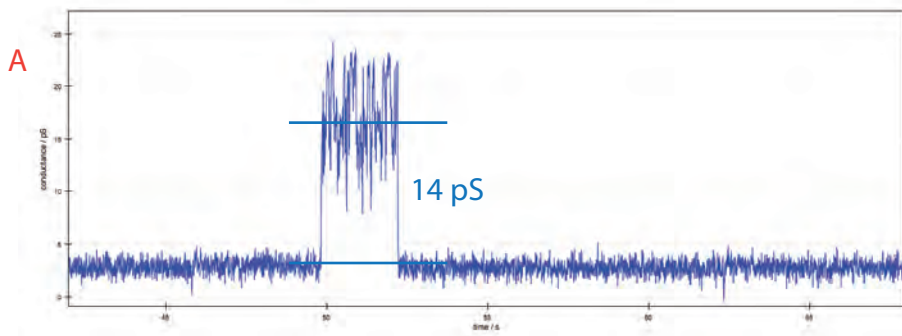
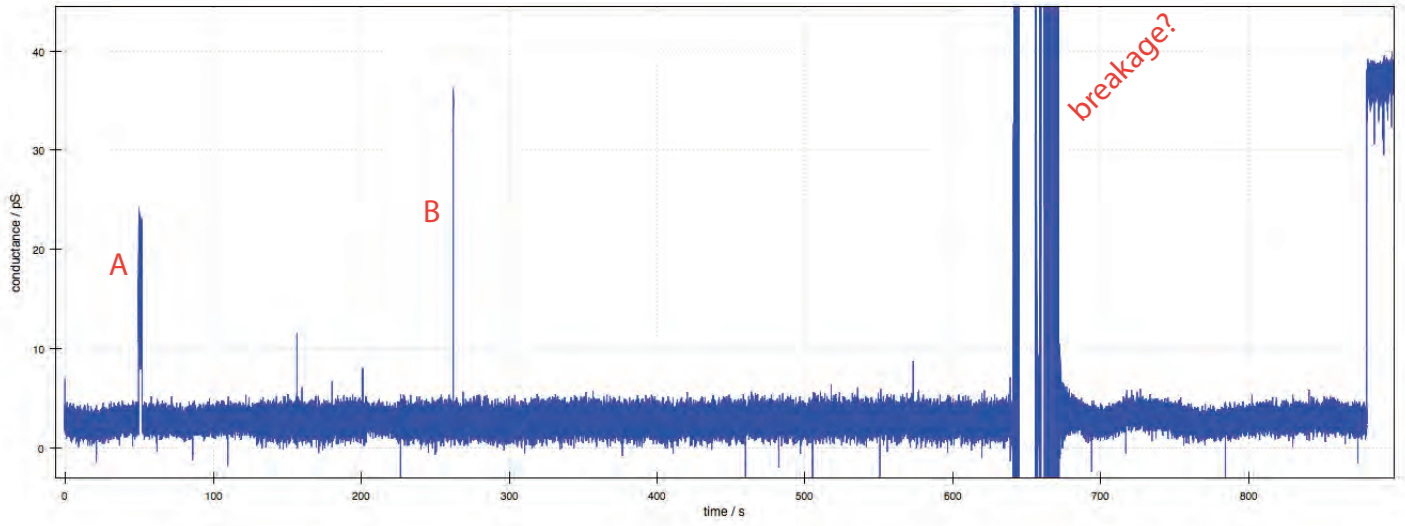


A

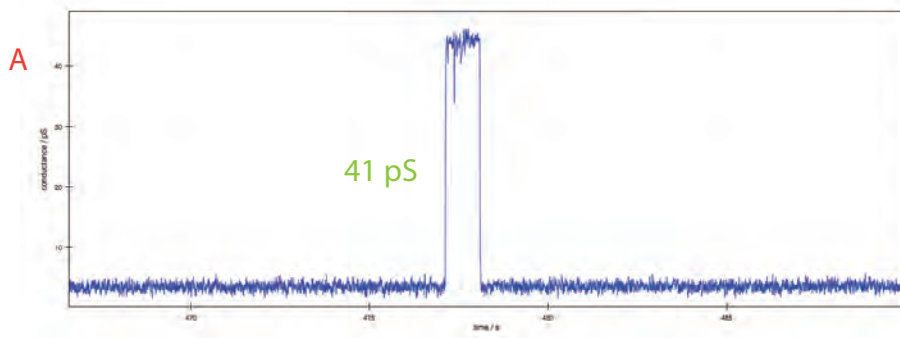
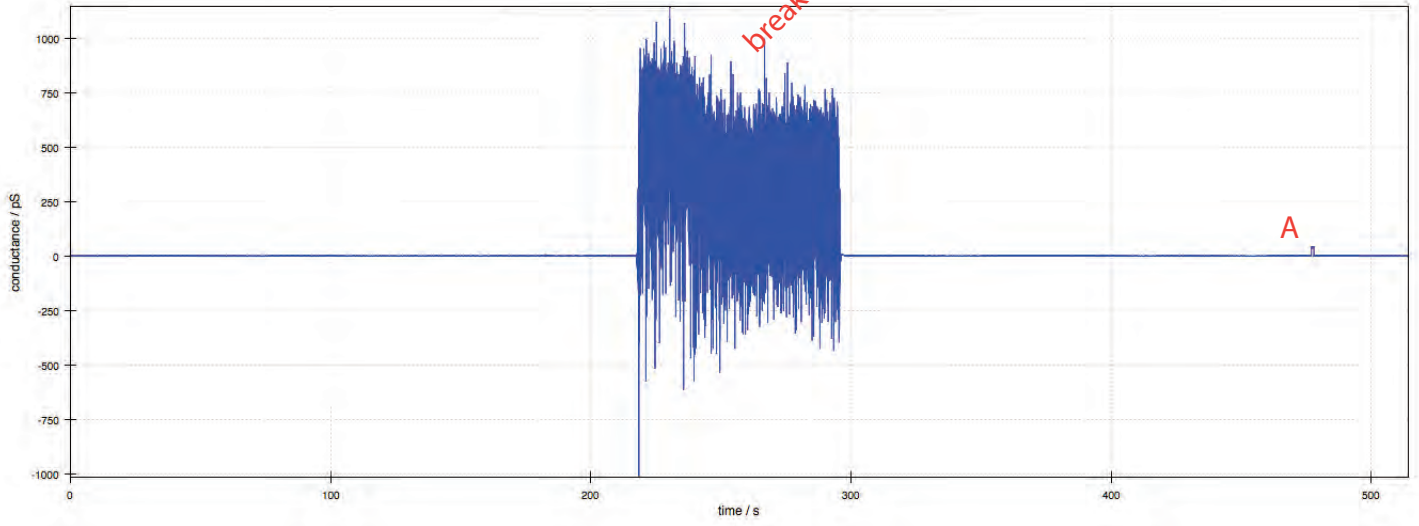


64.2.0001

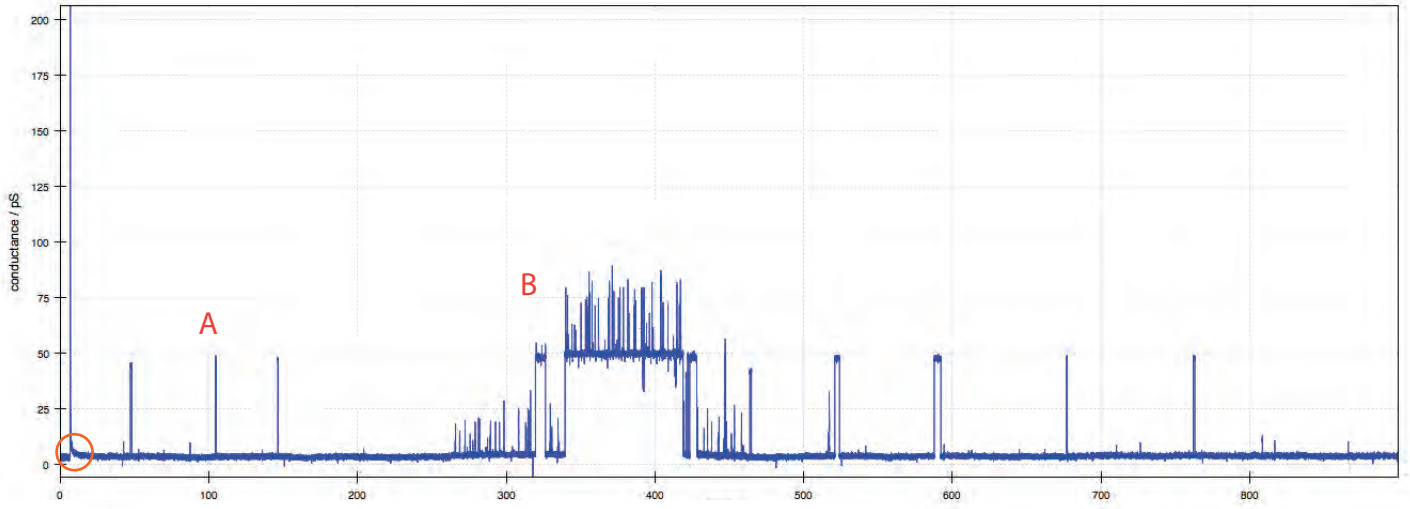




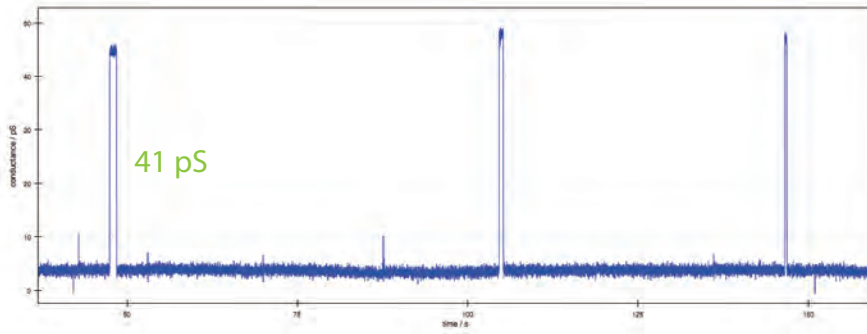
64.2.0003



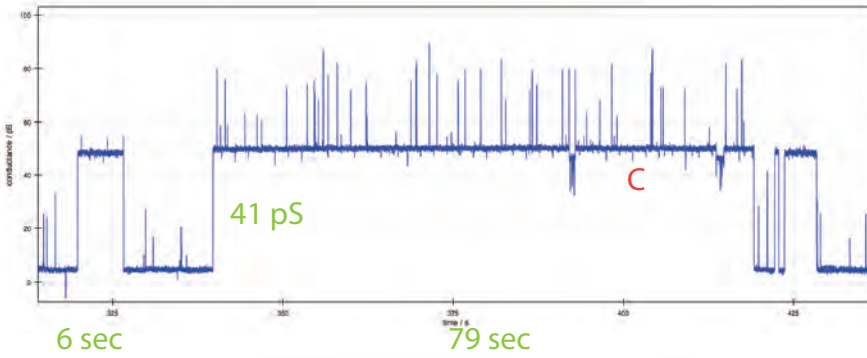
64.2.0004



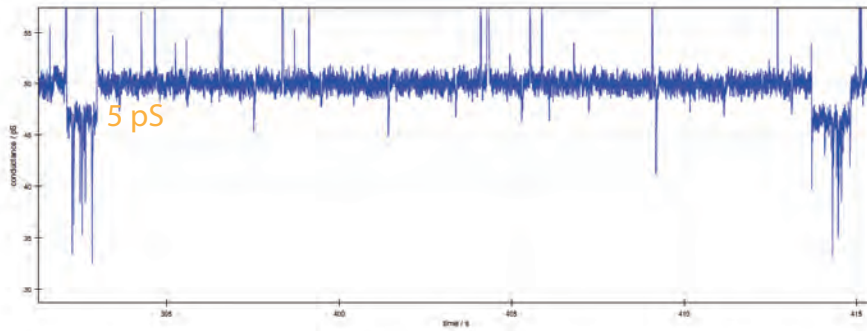
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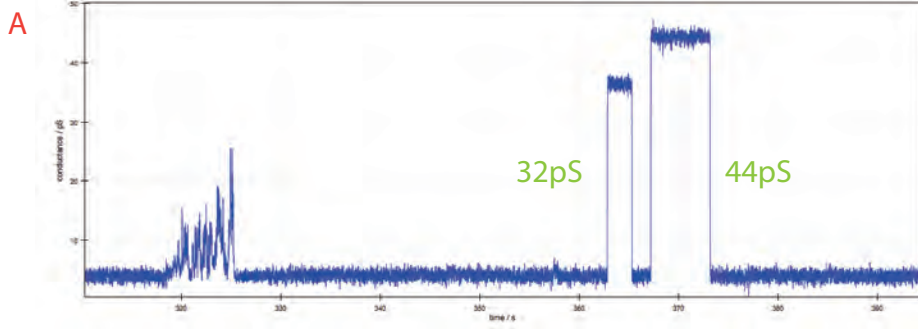
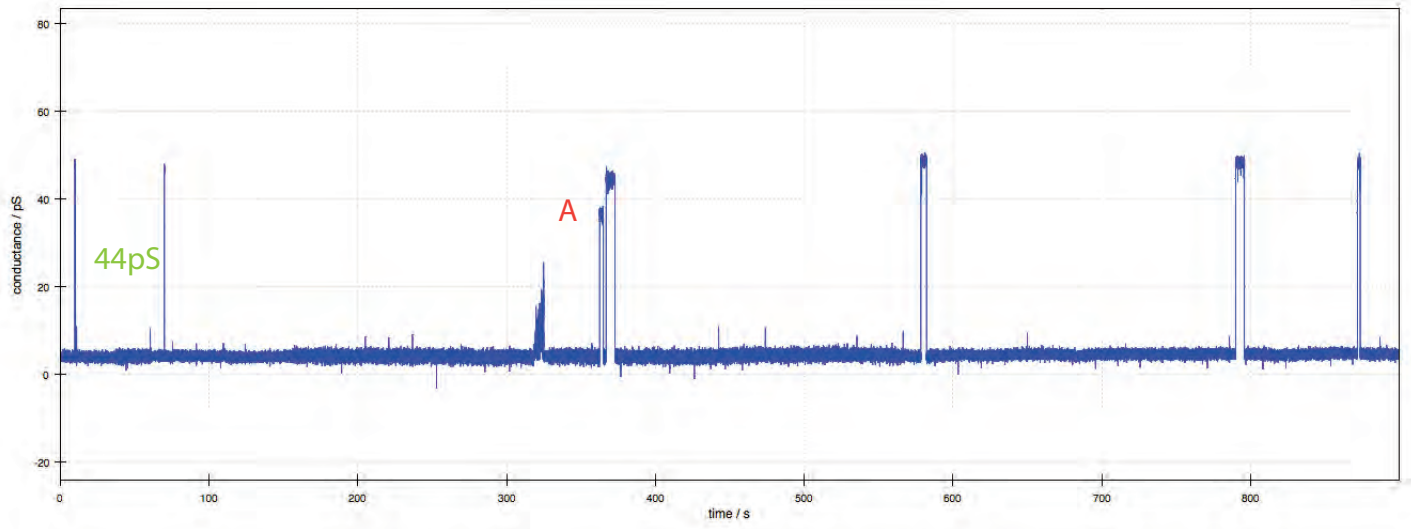
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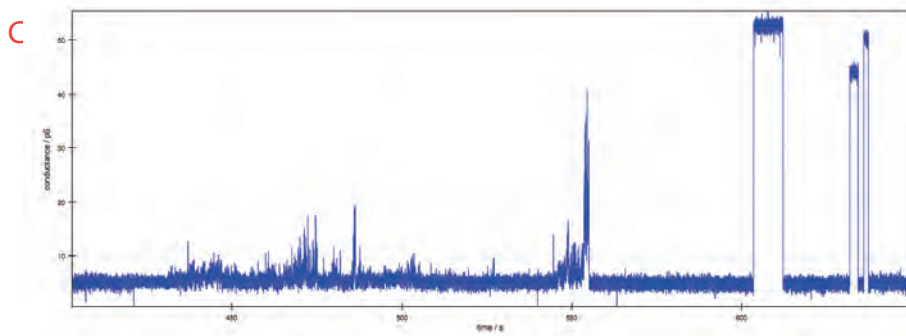
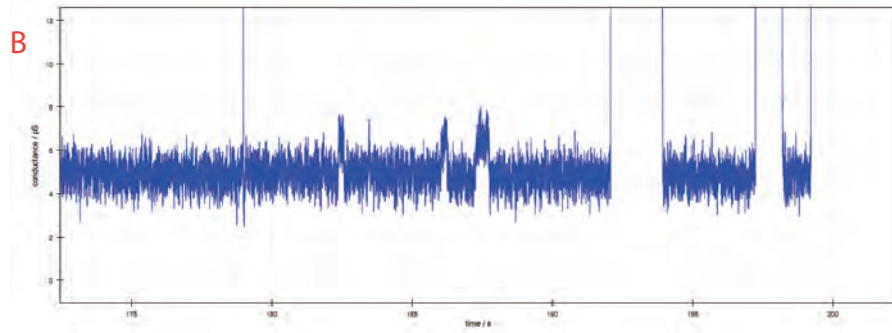
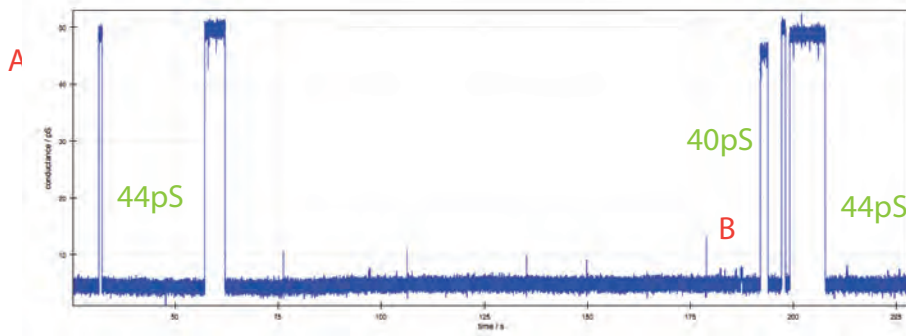
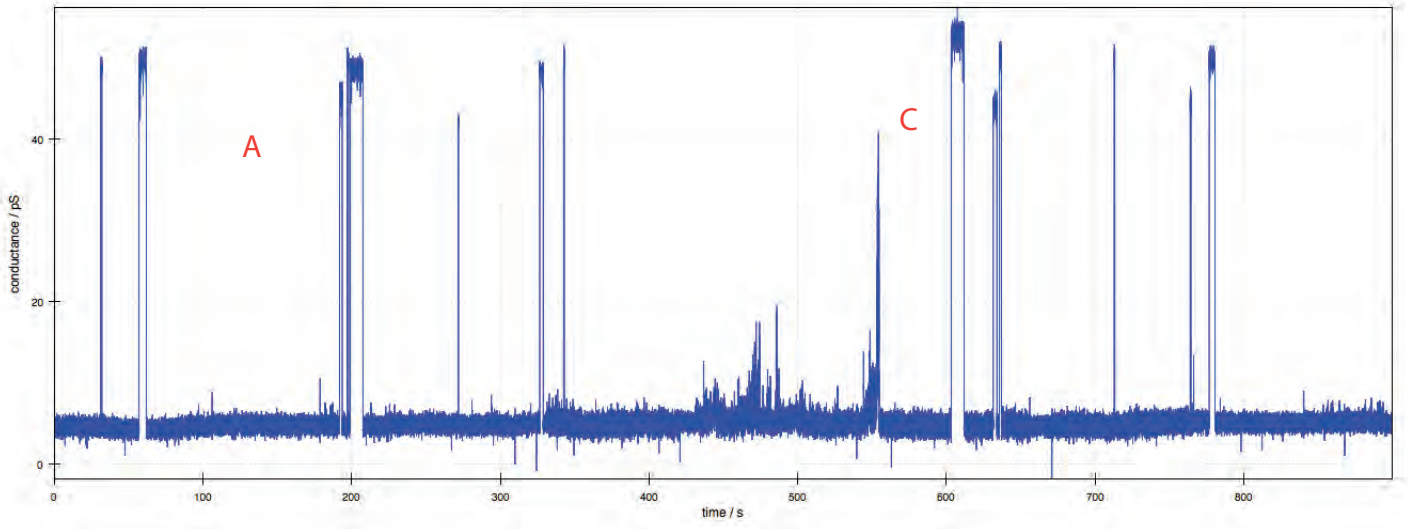


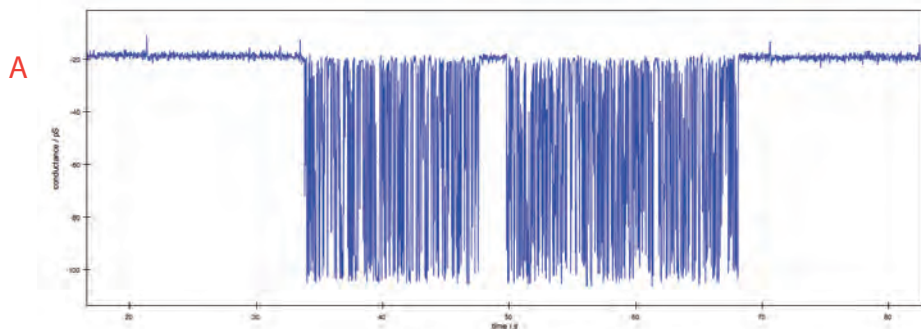
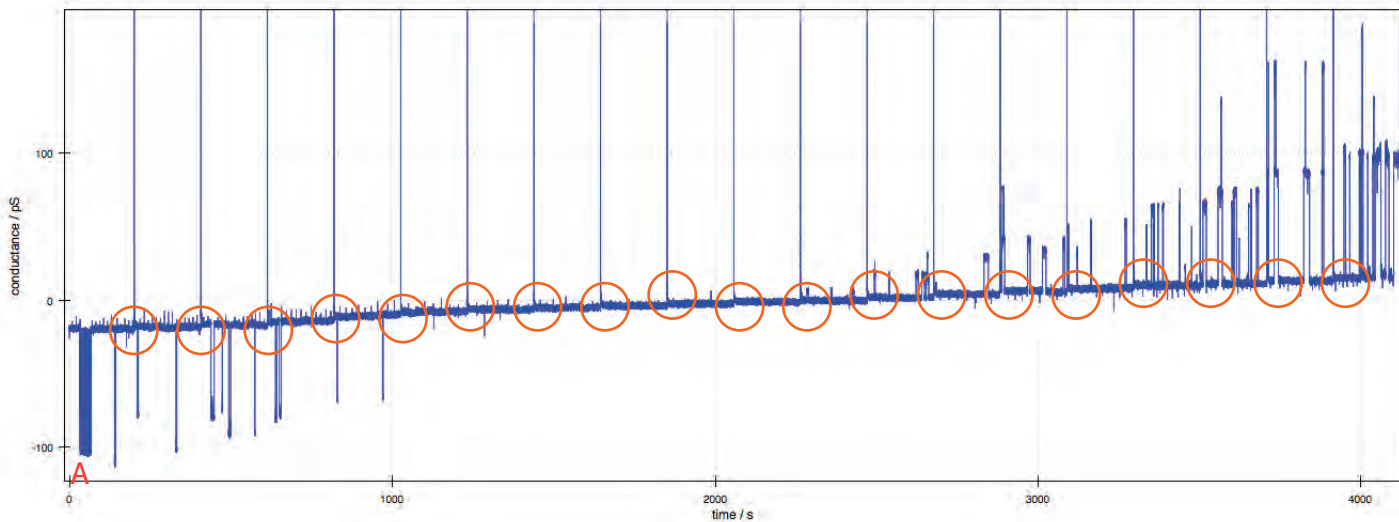
C



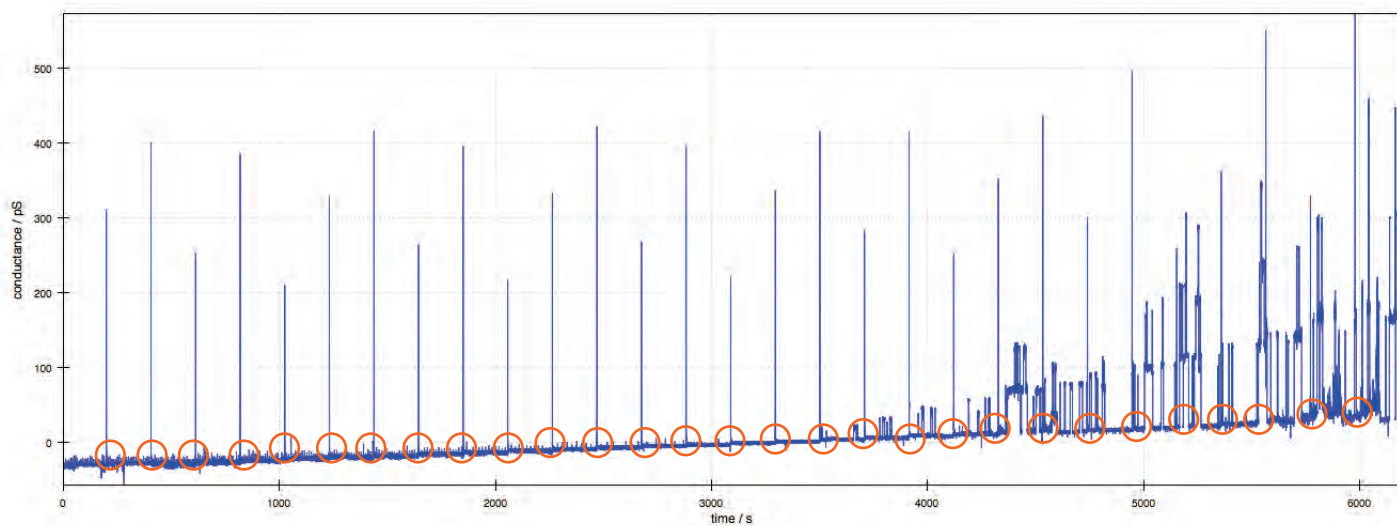
64.2.0005



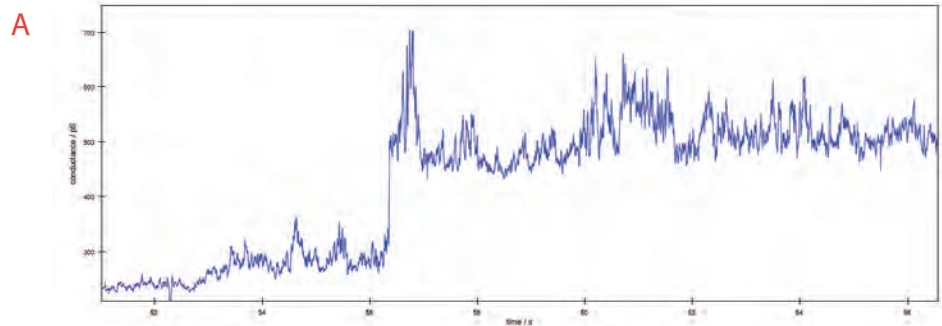
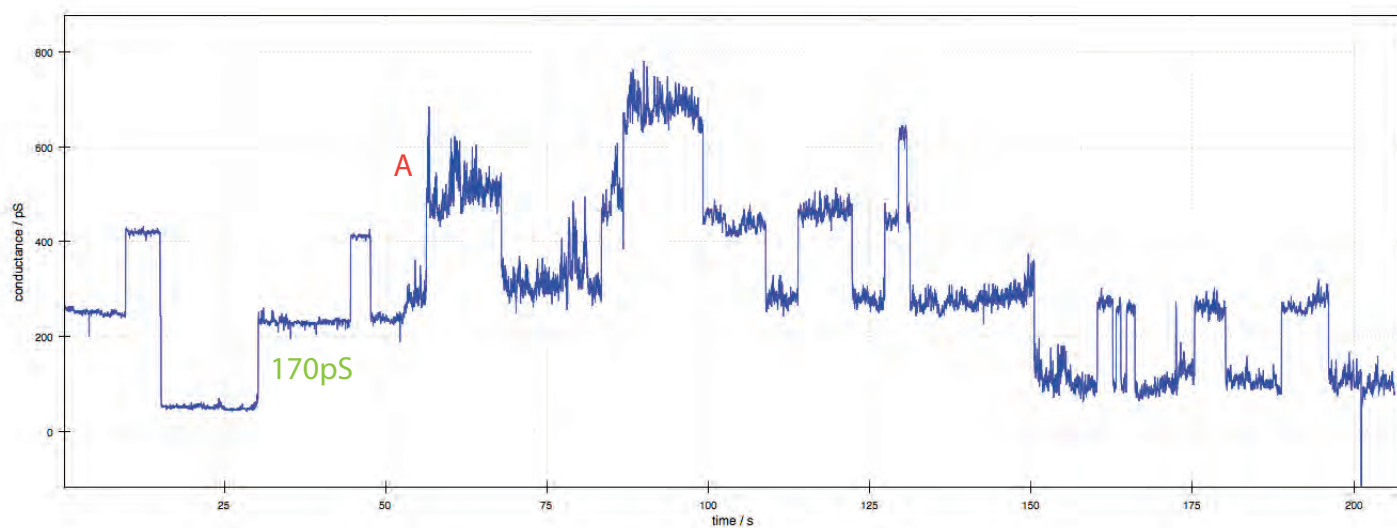




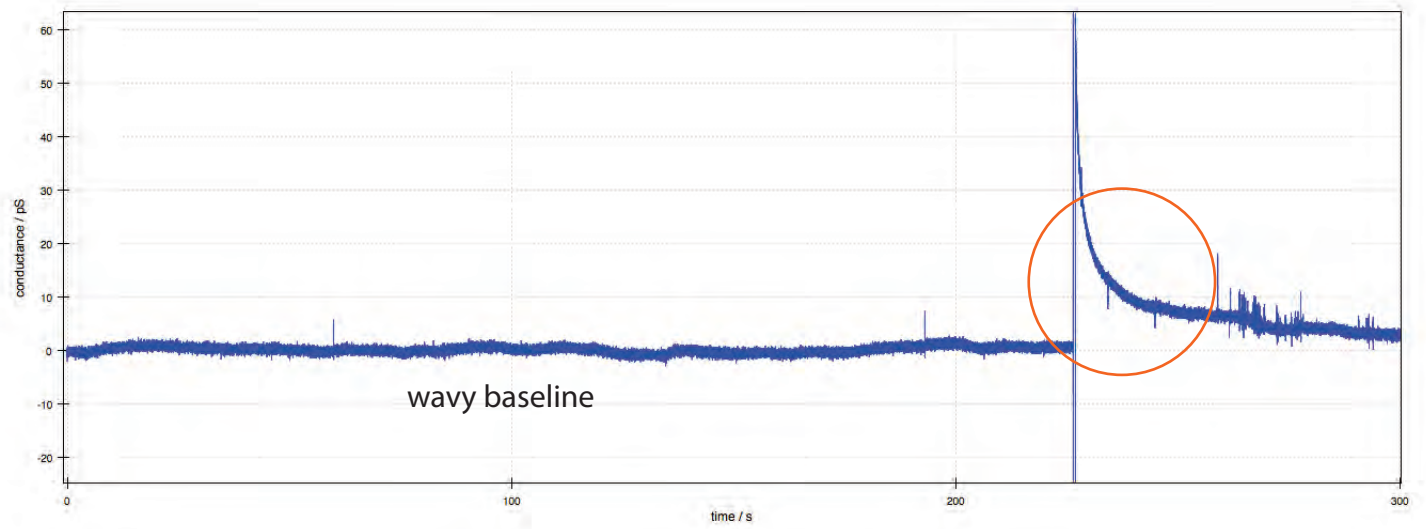
Note this interesting yellow;
note increased probability of opening at positive potentials

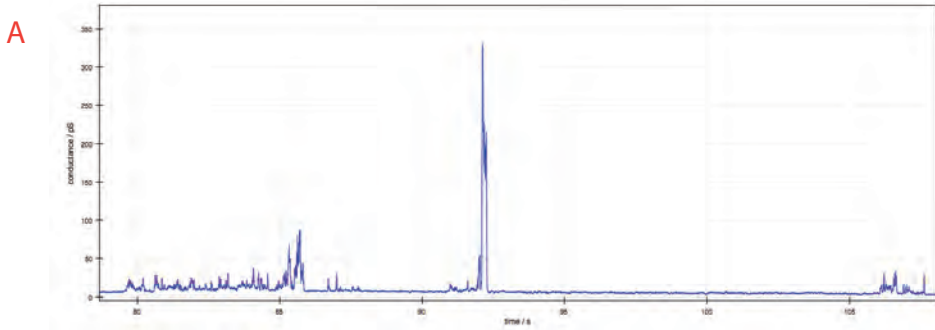
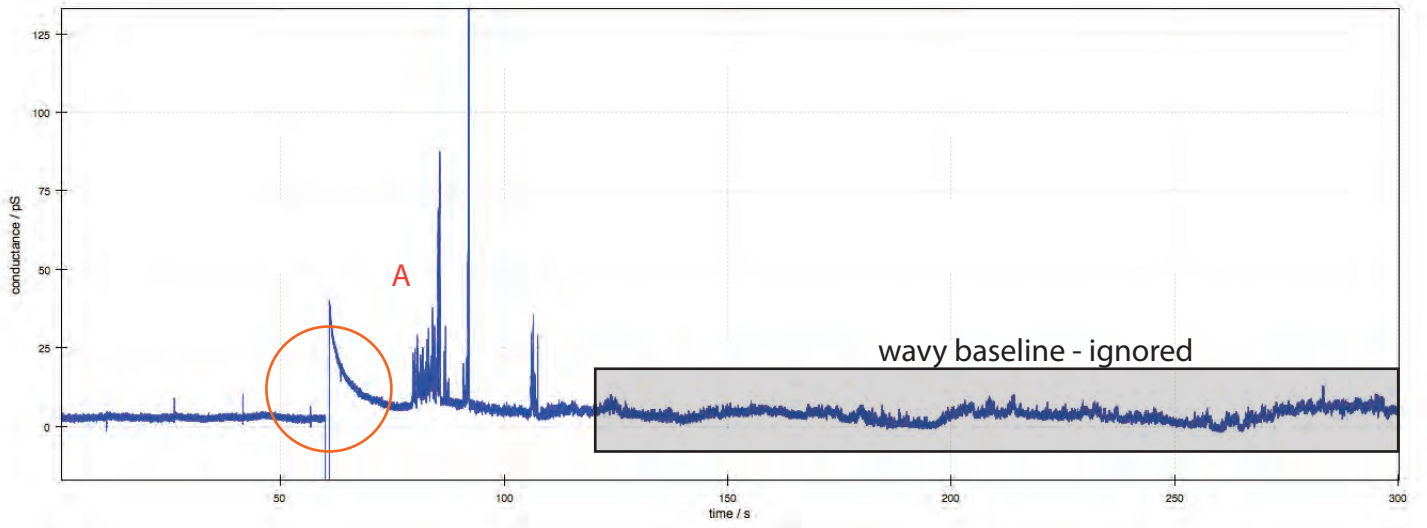


Note increased probability of opening with positive potentials

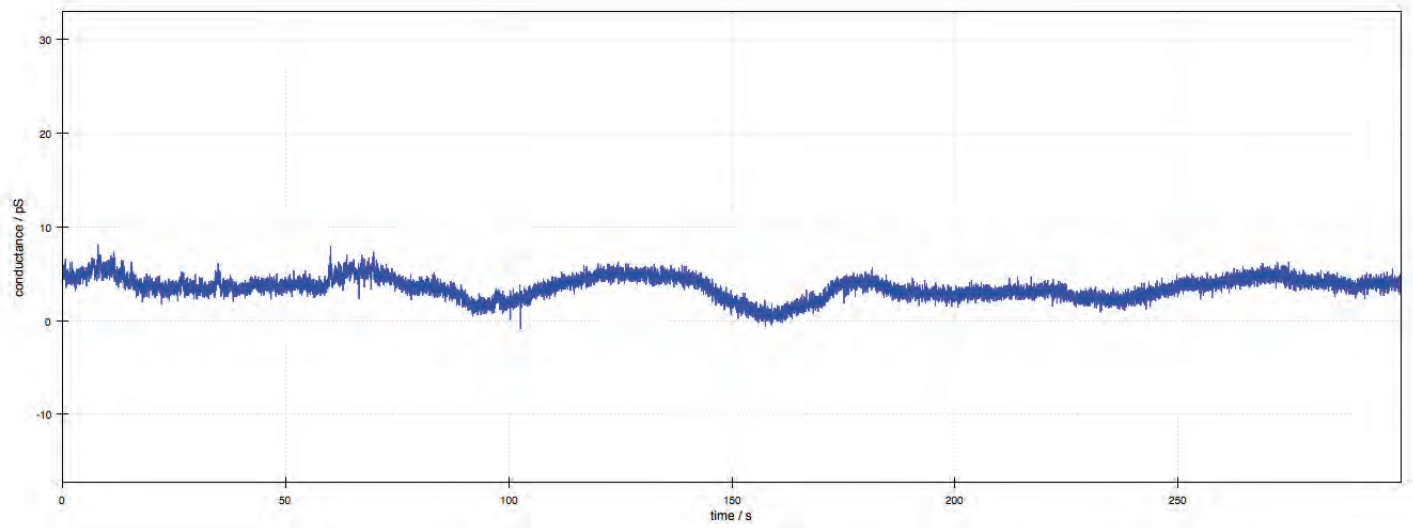


64.3.0000



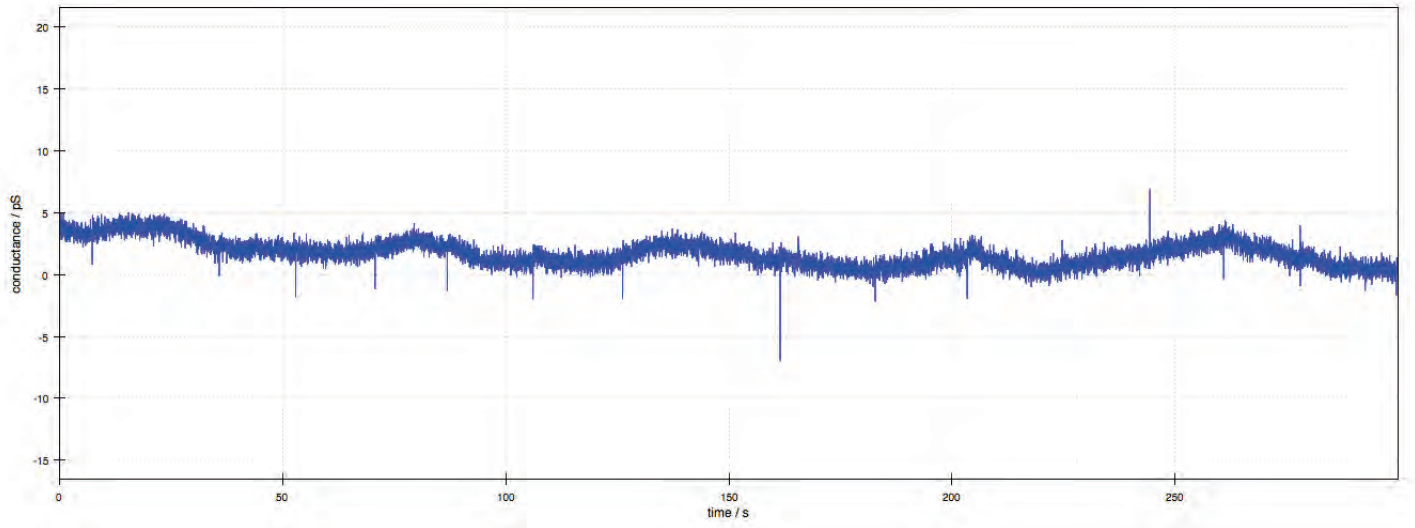


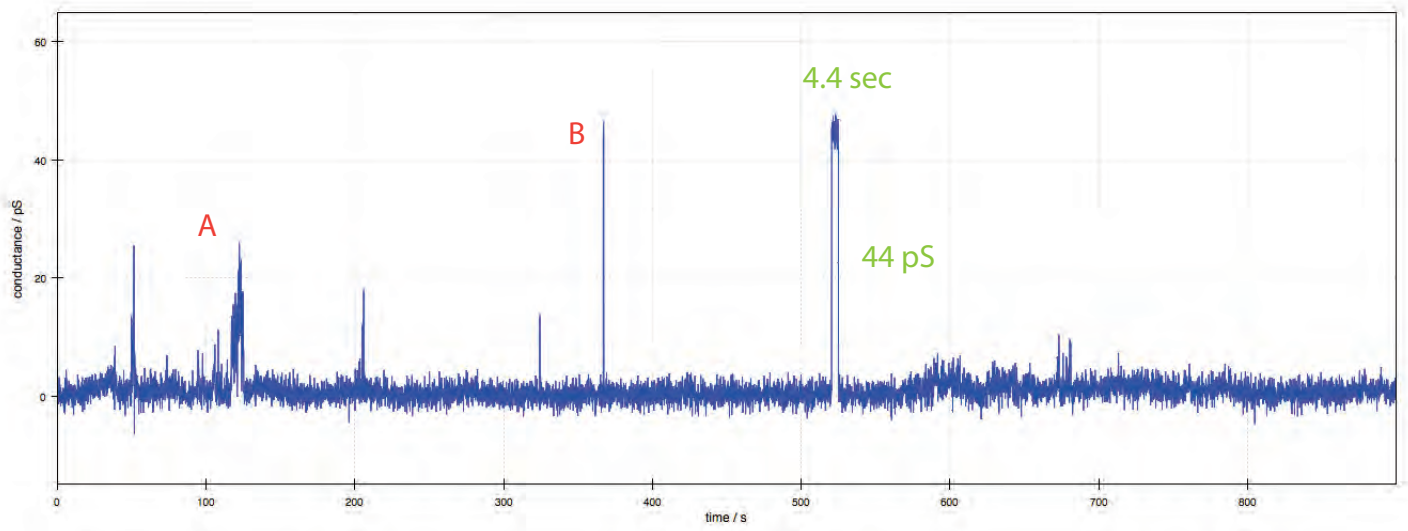
64.3.0002



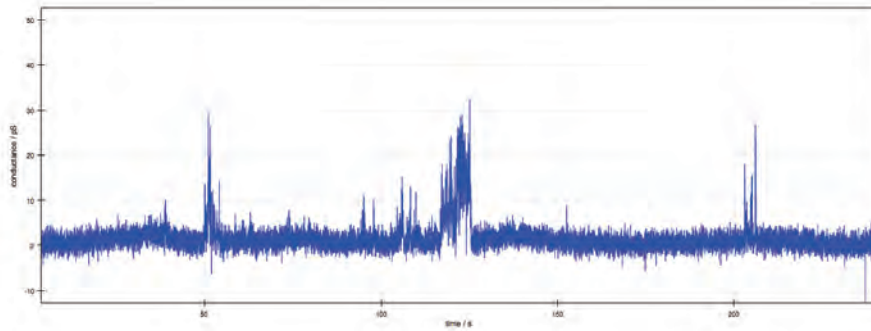
wavy baseline

64.3.0003

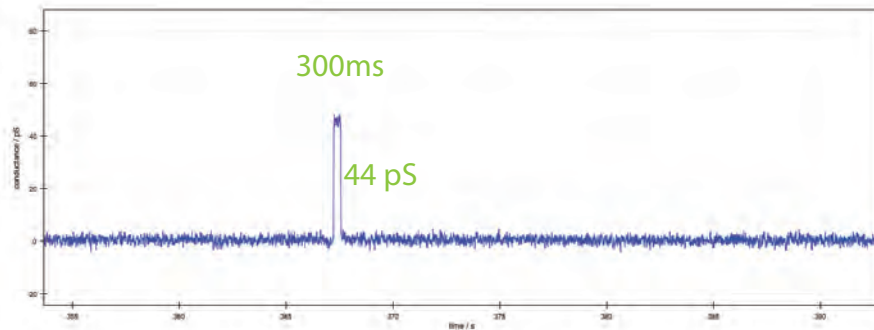




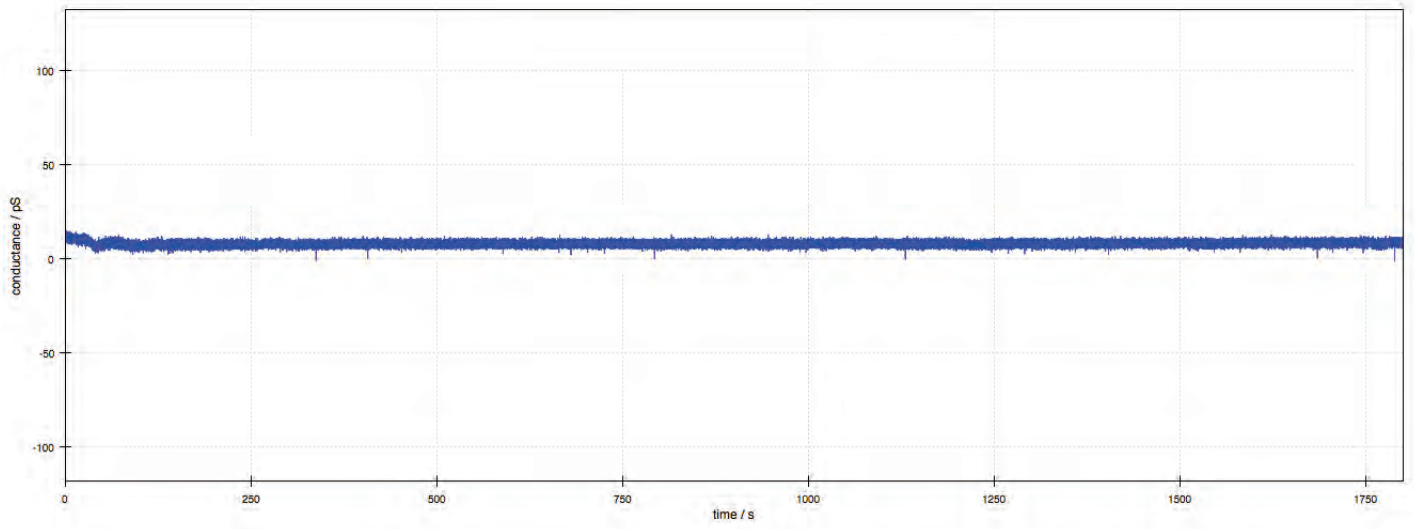
A

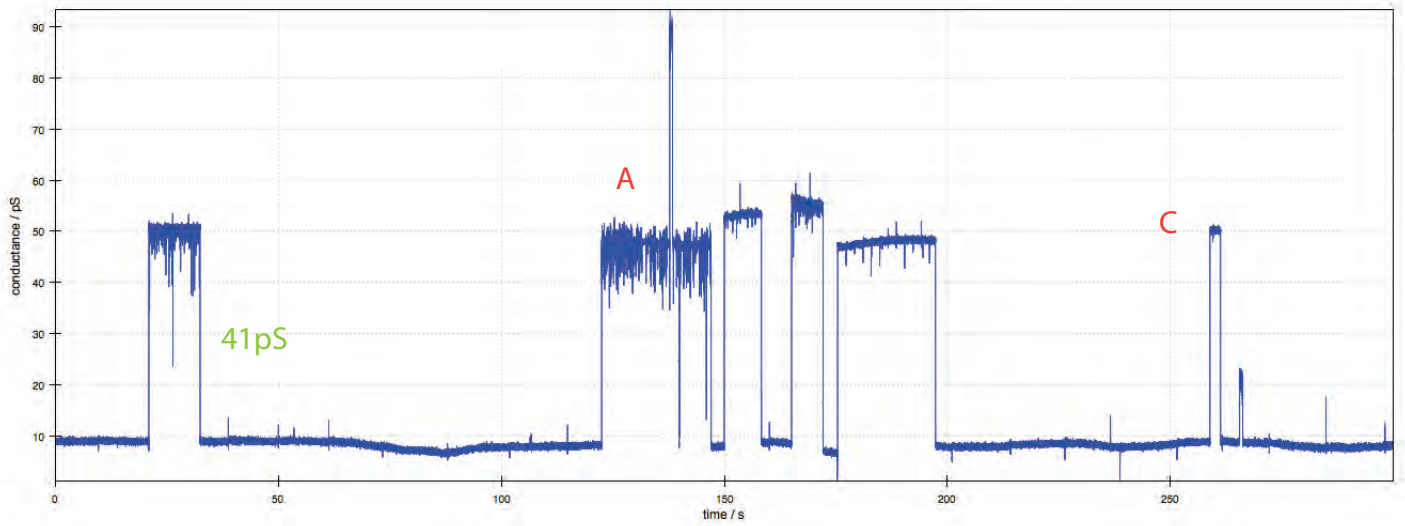


B

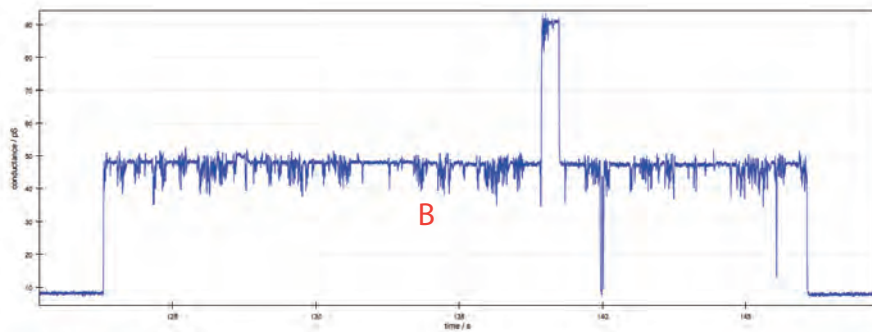


64.3.0005



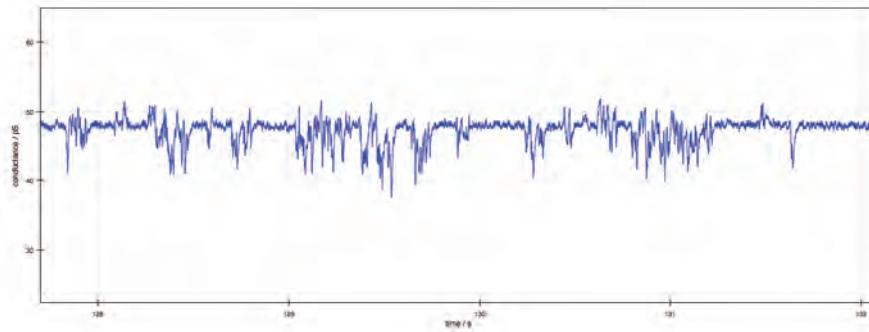


A

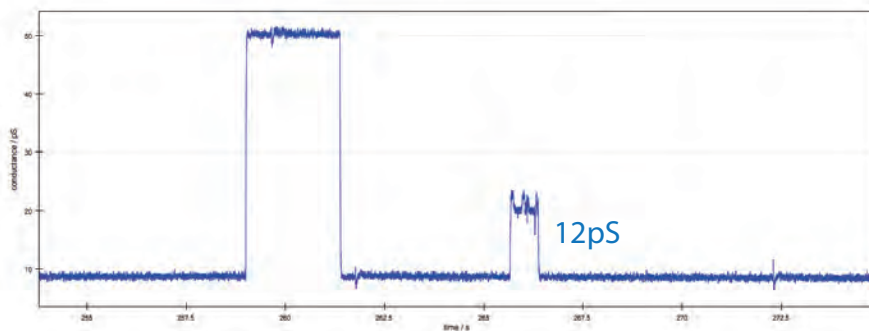


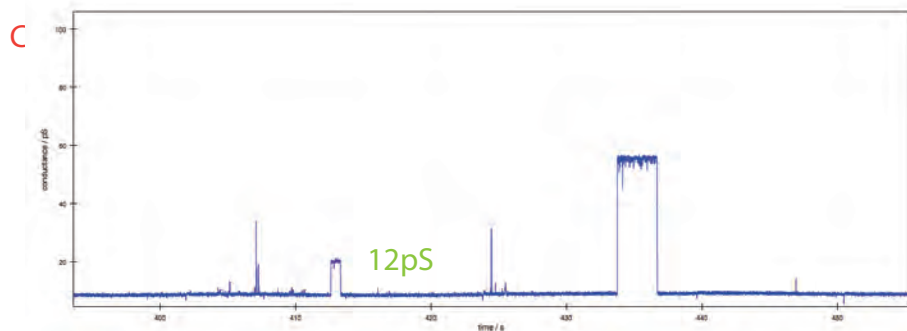
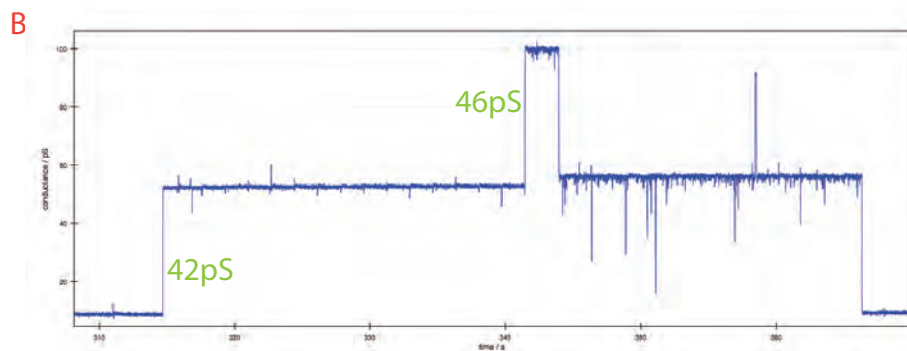
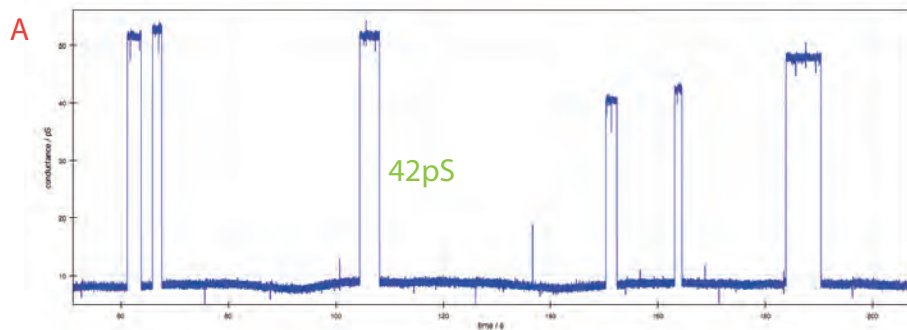
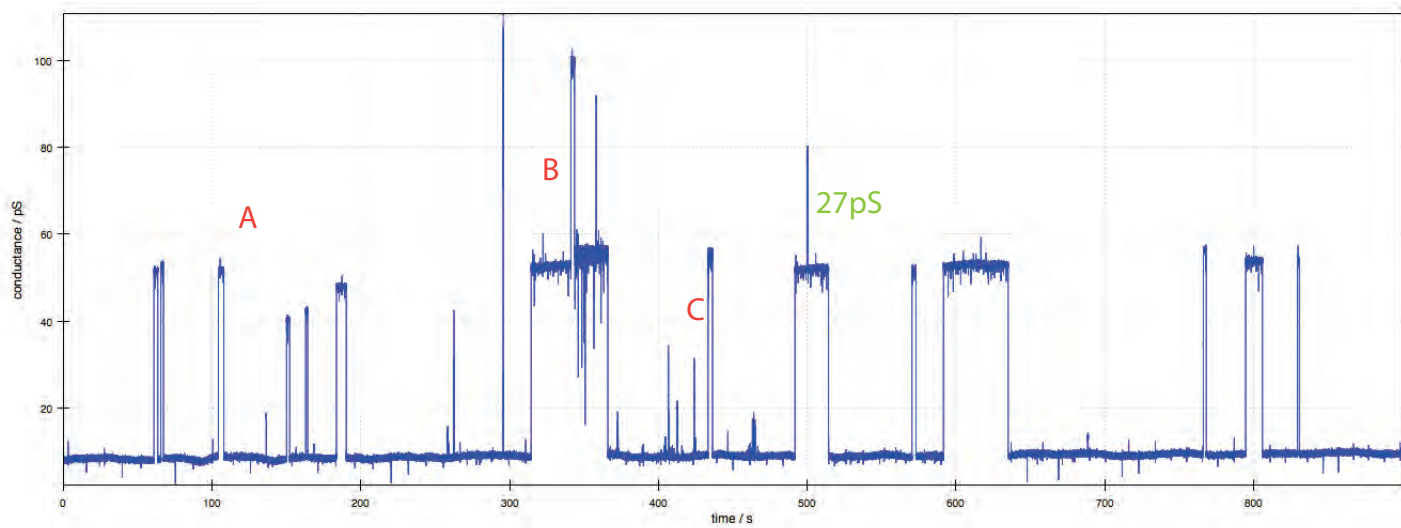
B

B

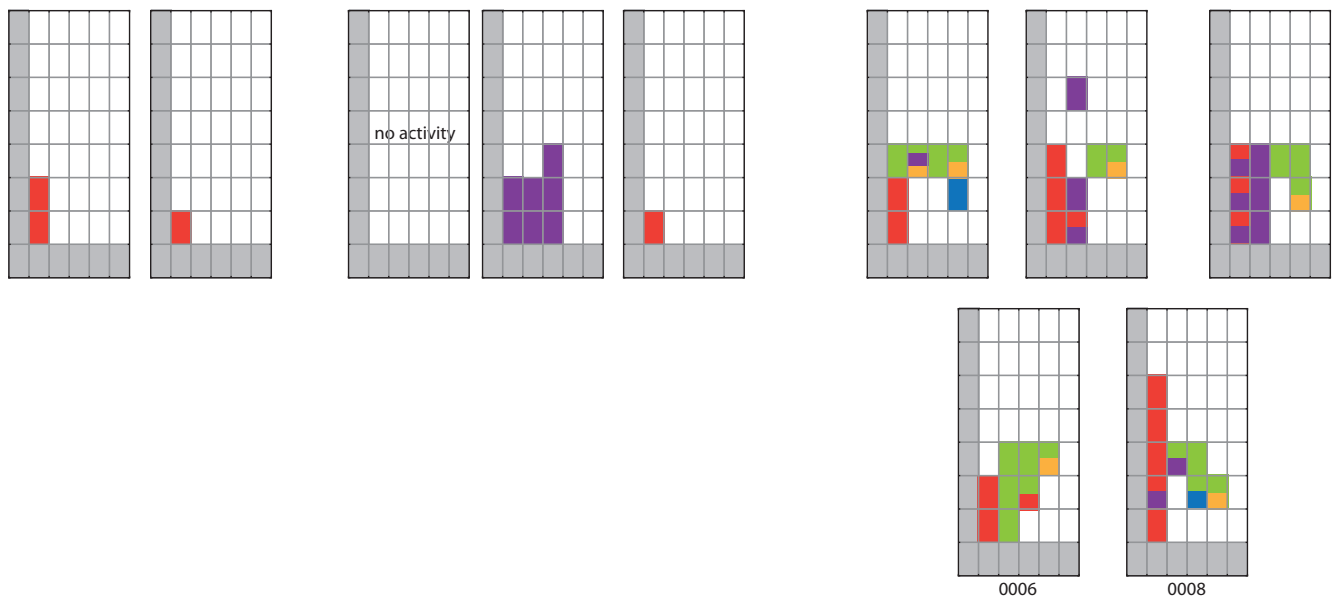
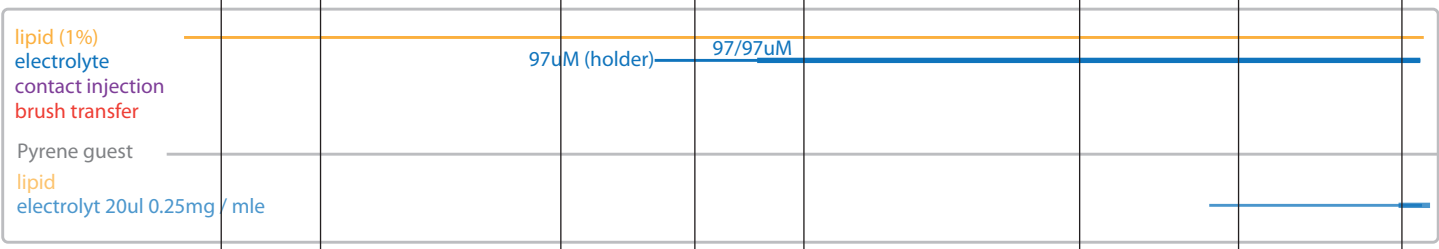
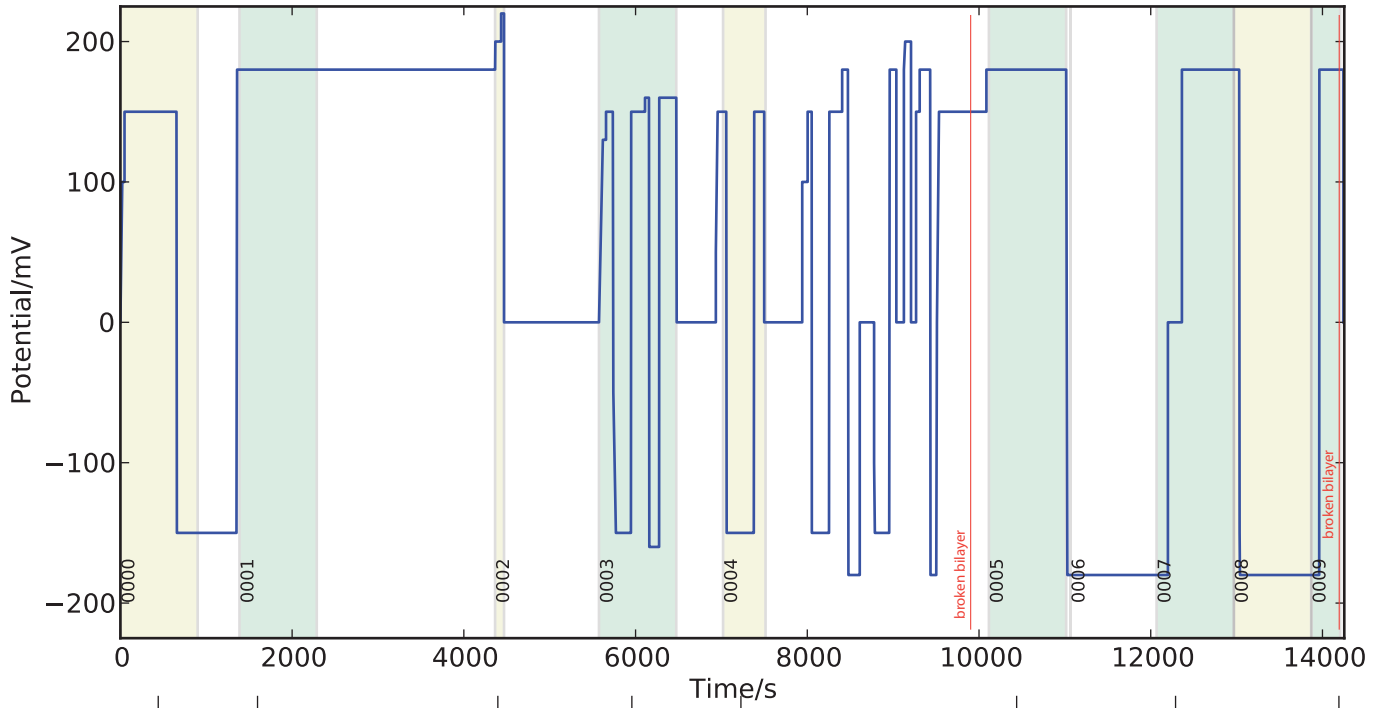


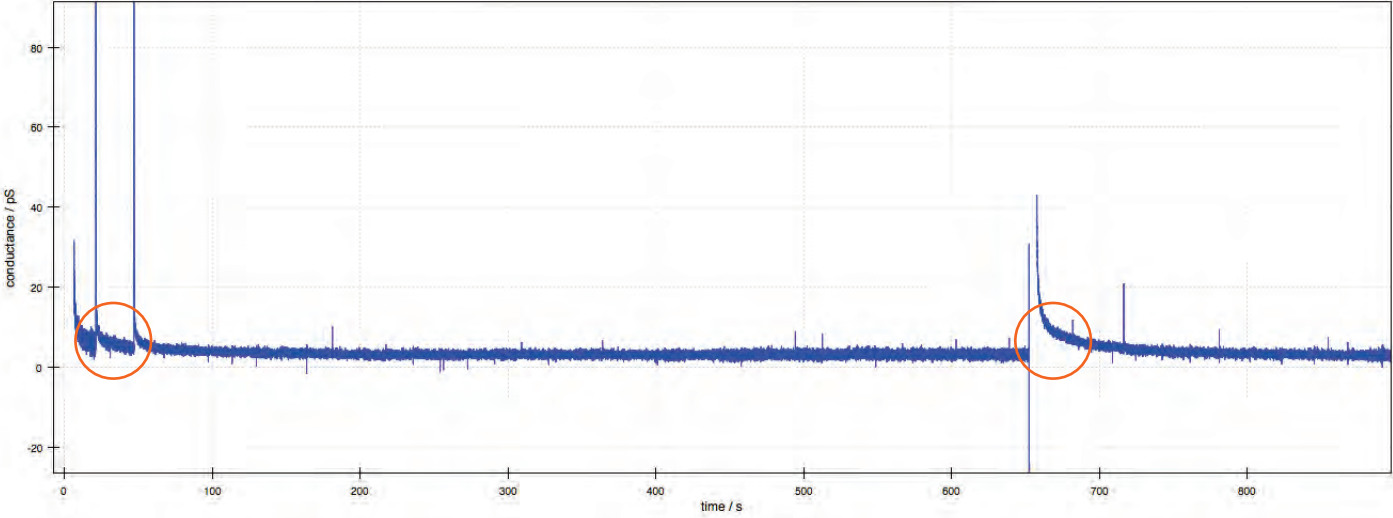
C



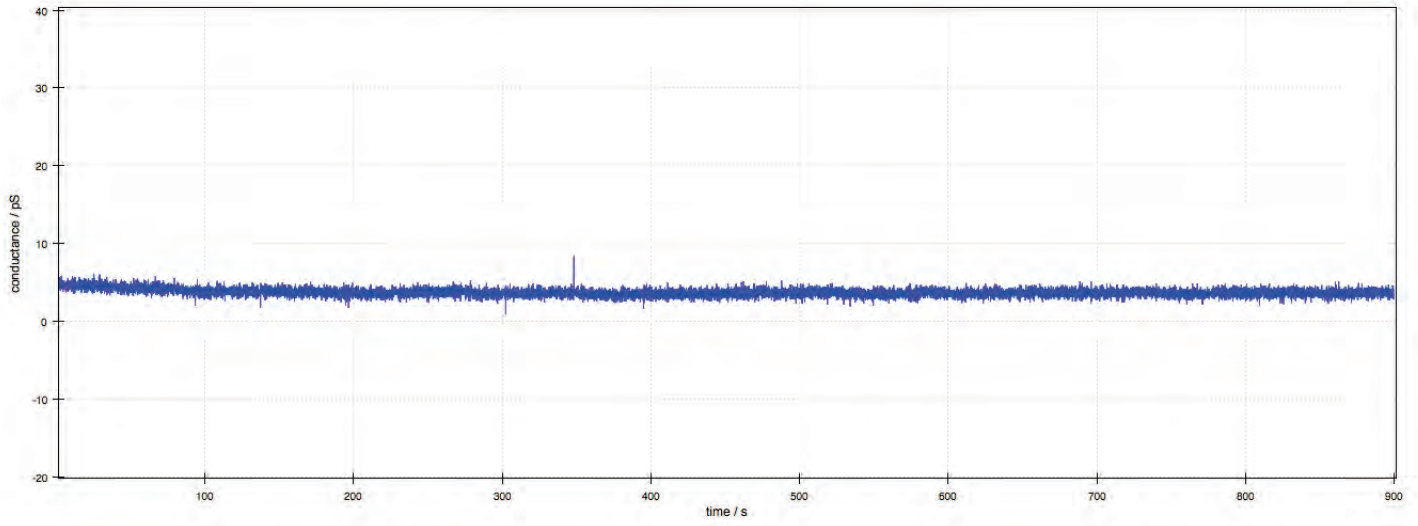


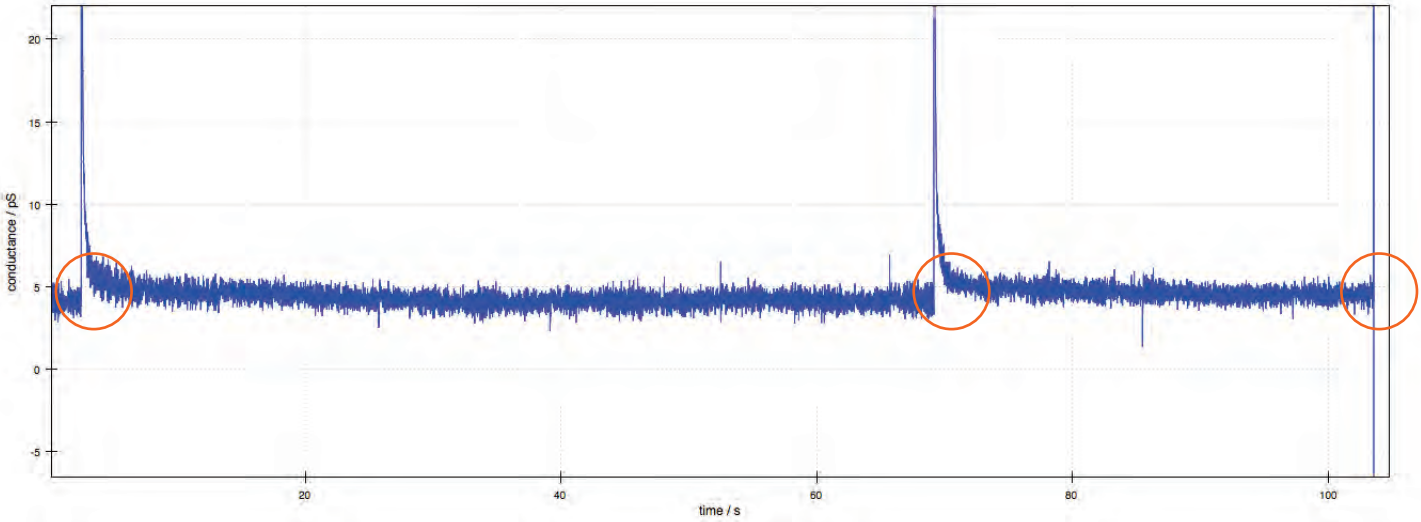
[JC-66] bCD-6N4 - 1M CsCl unbuffered 1percent



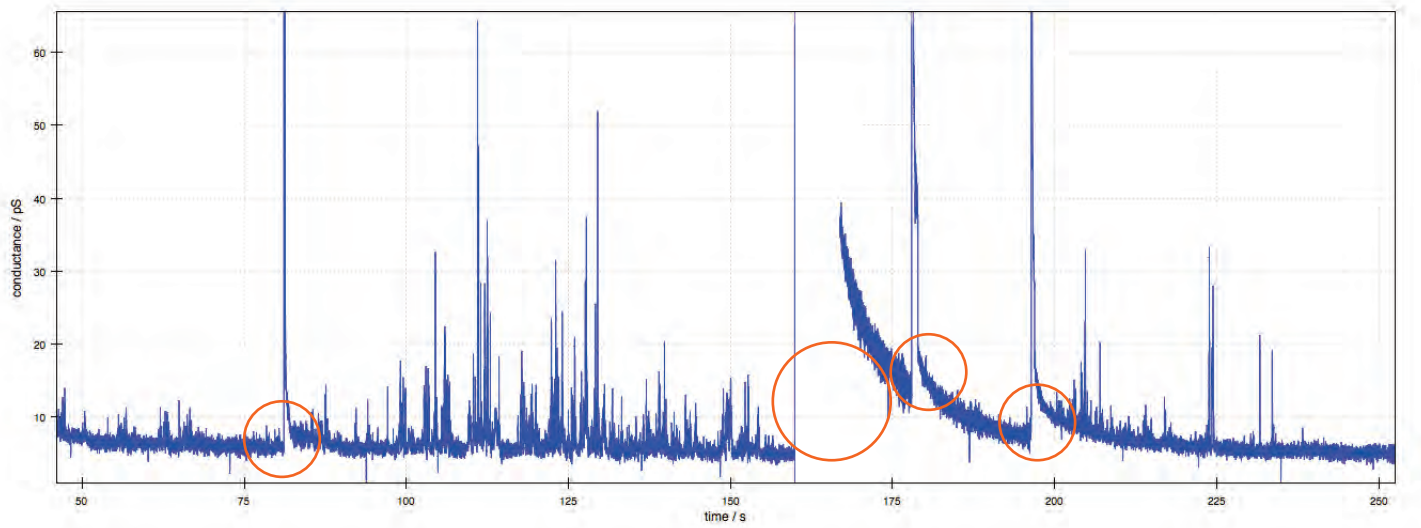
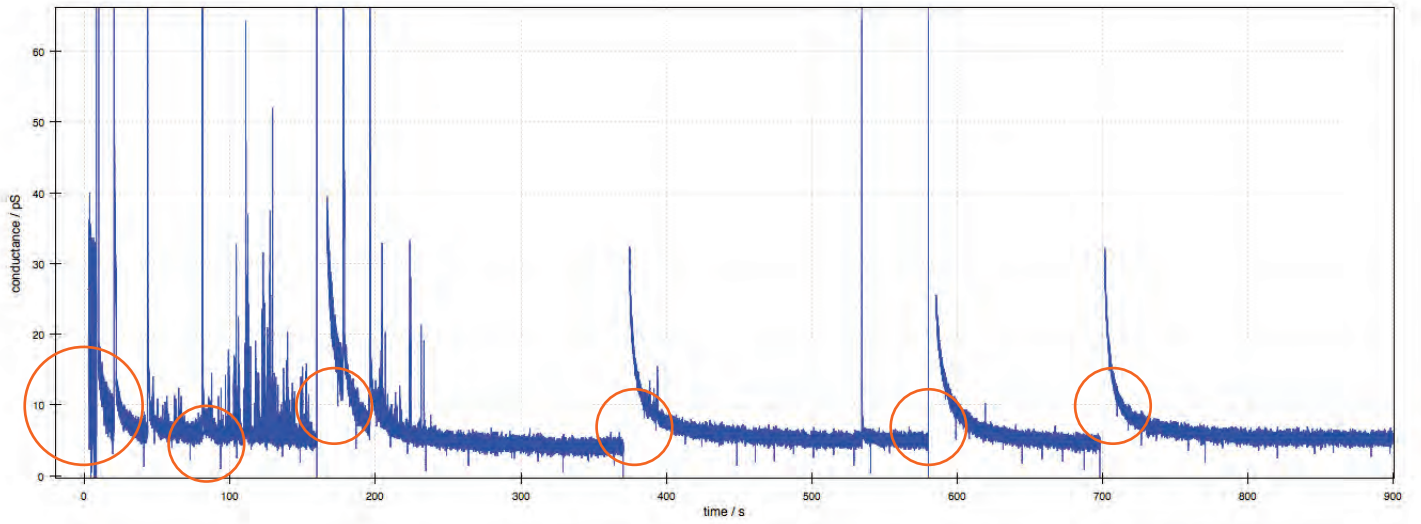


66-0001

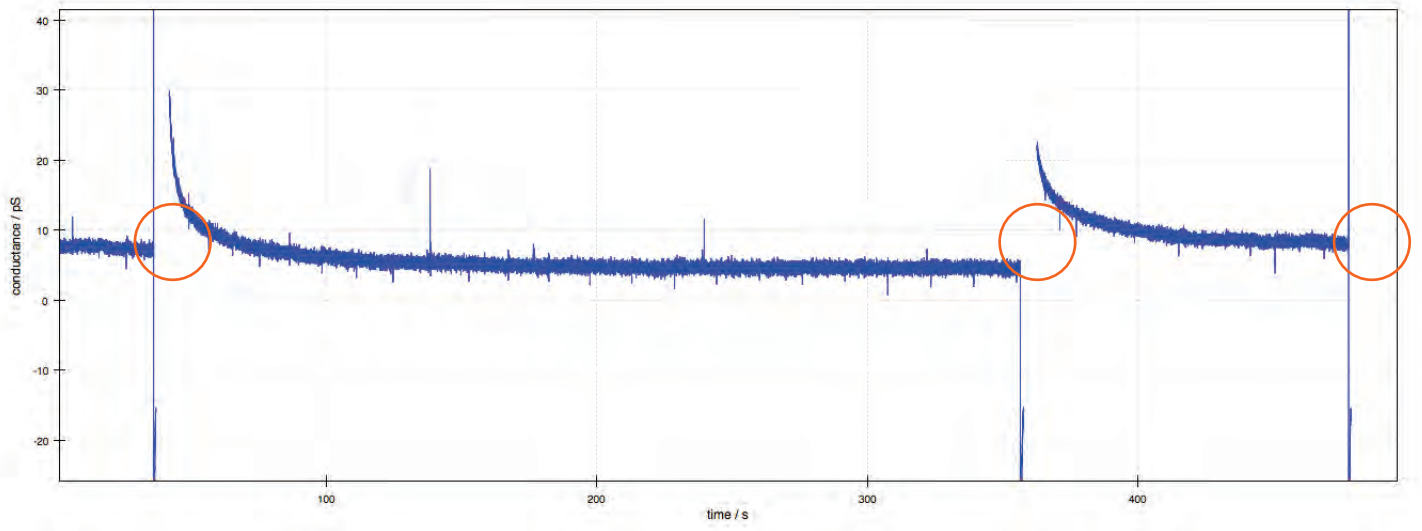


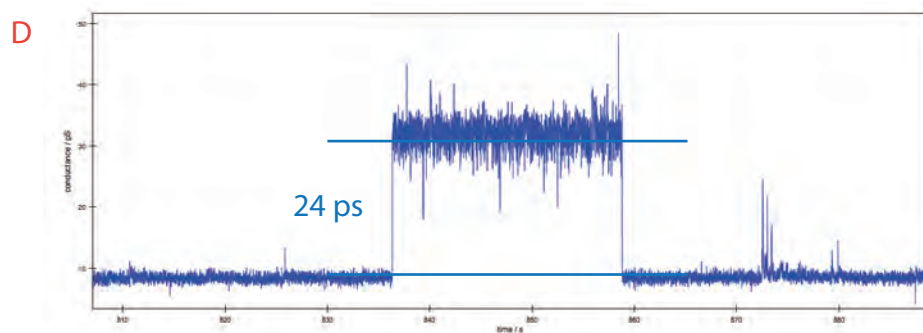
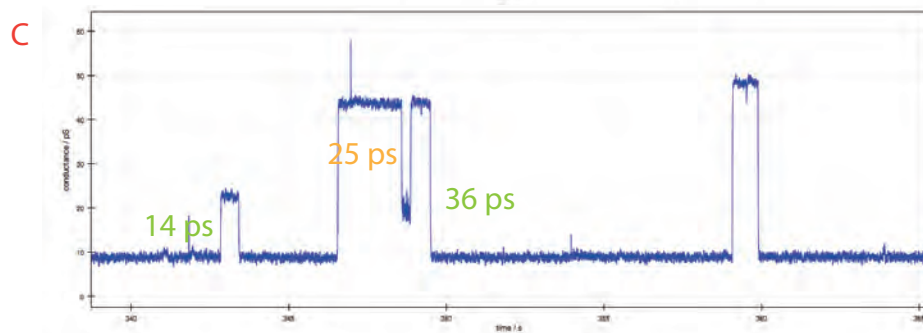
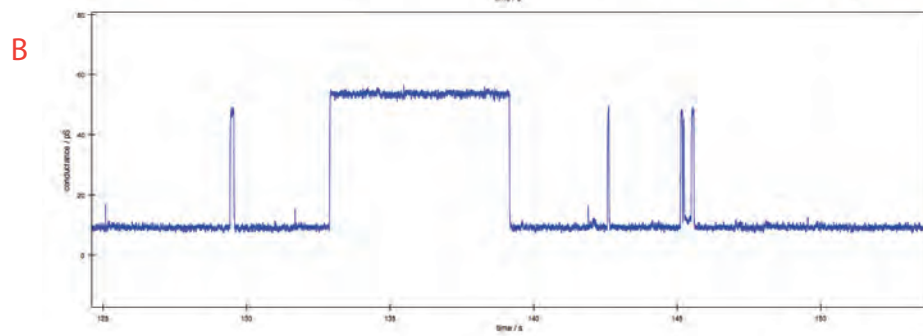
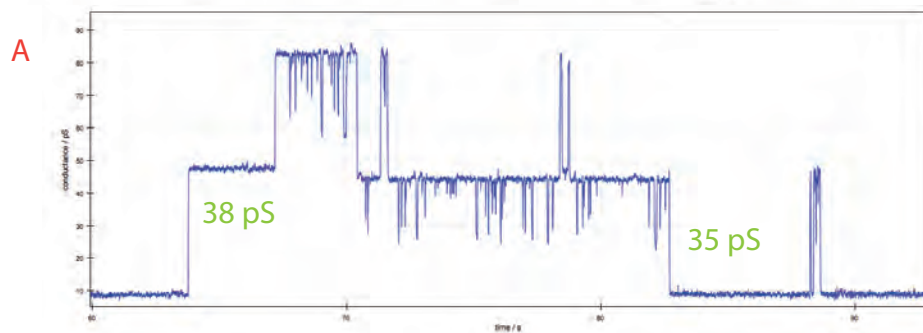
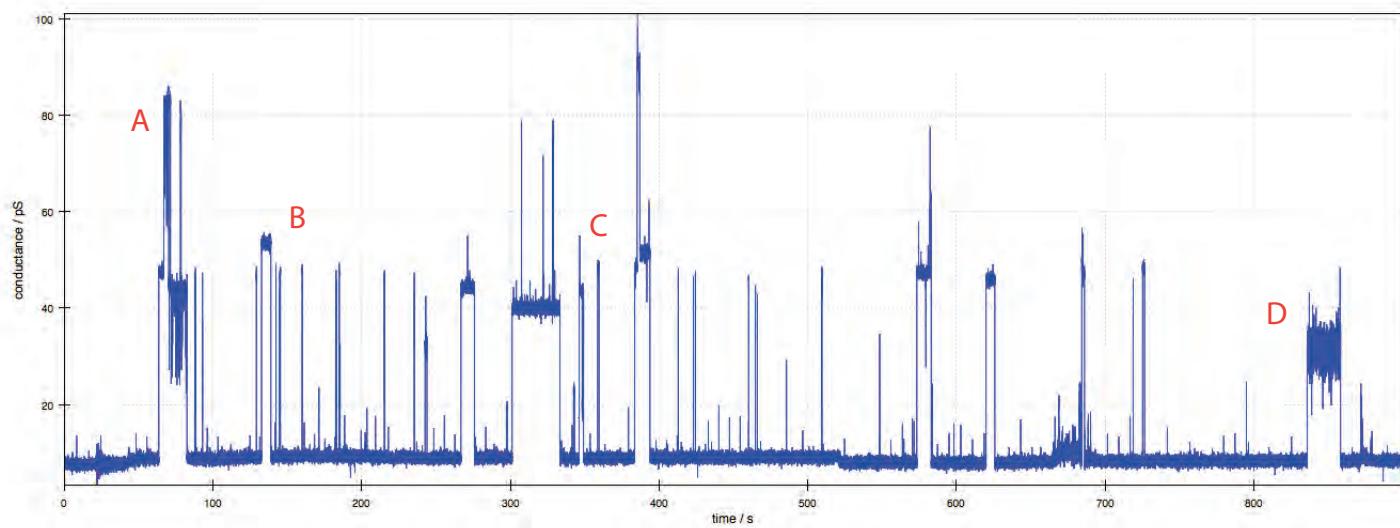


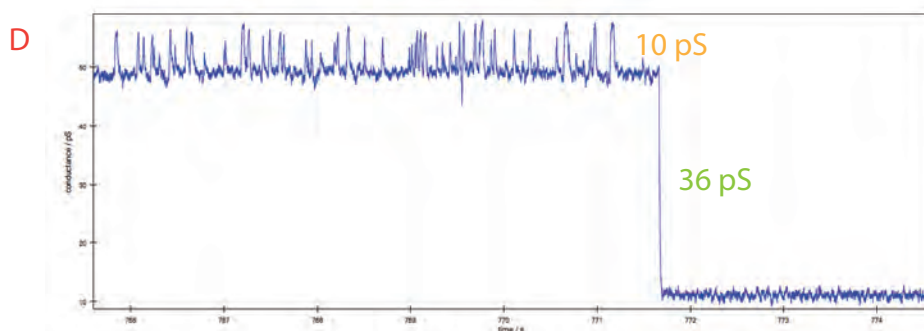
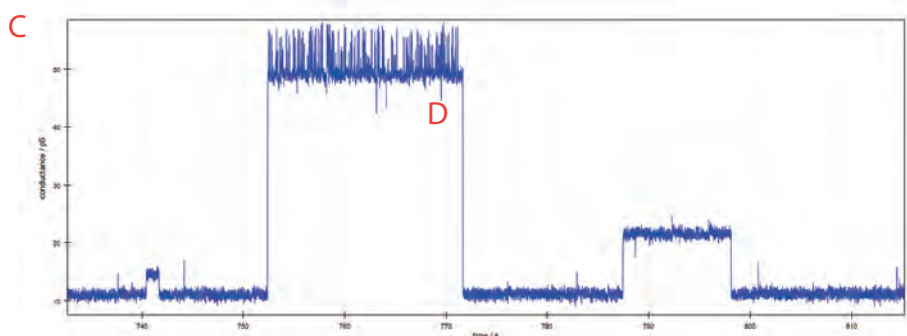
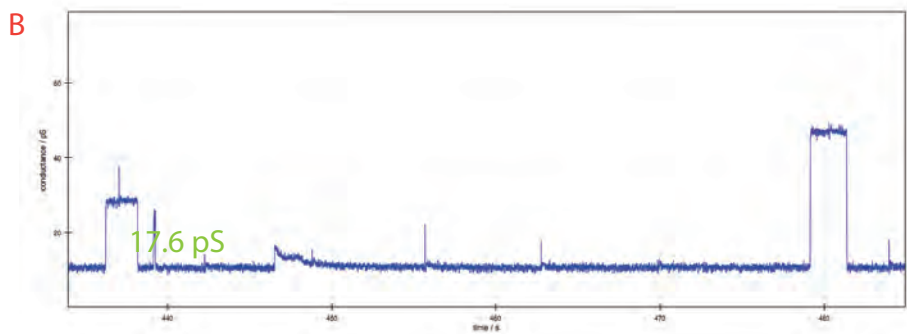
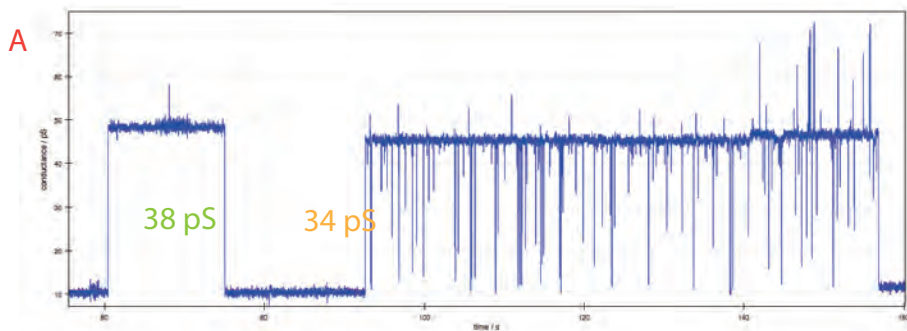
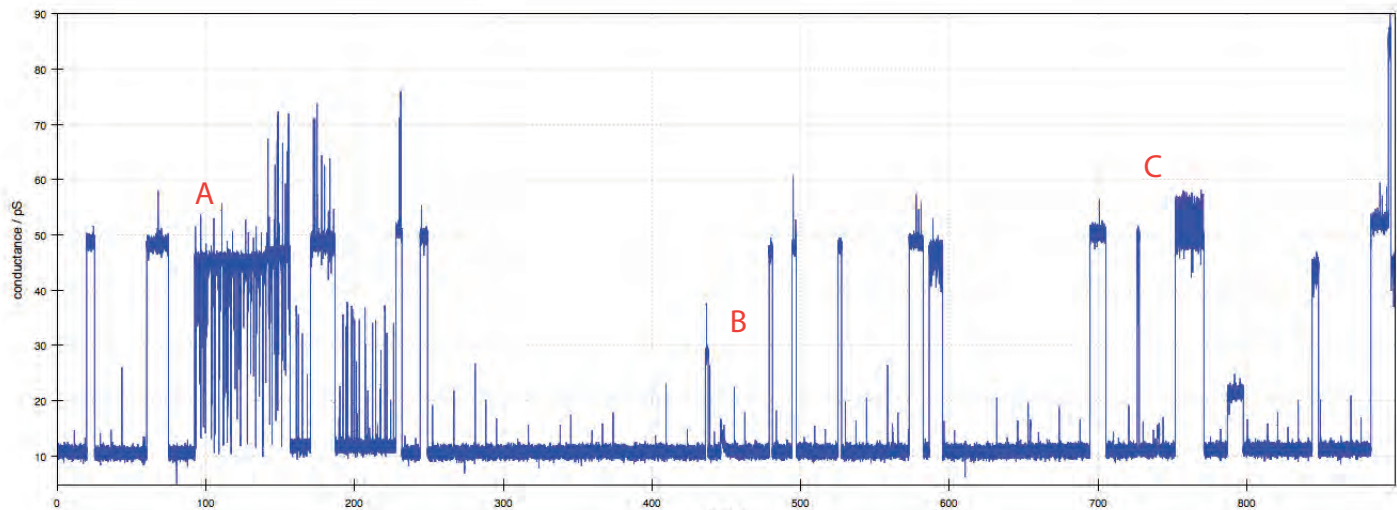
66-0003

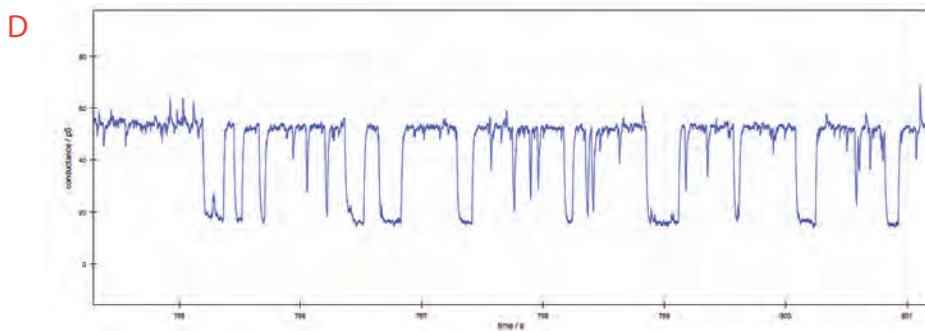
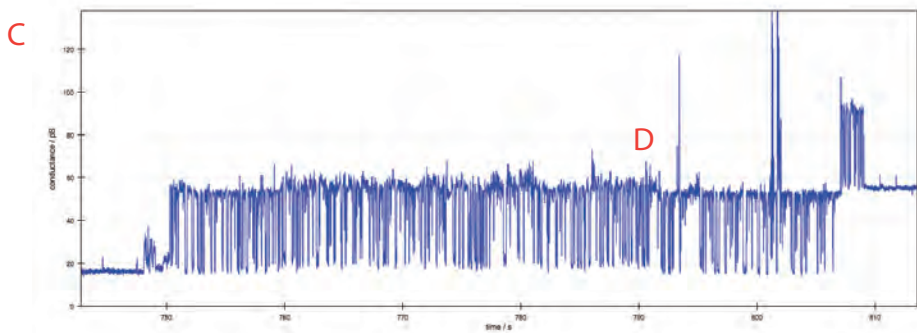
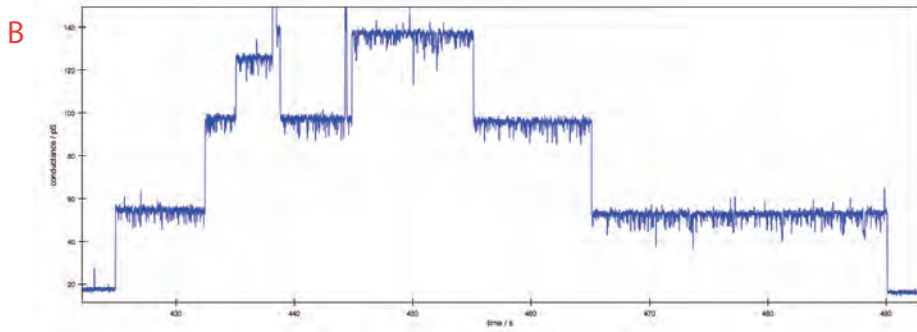
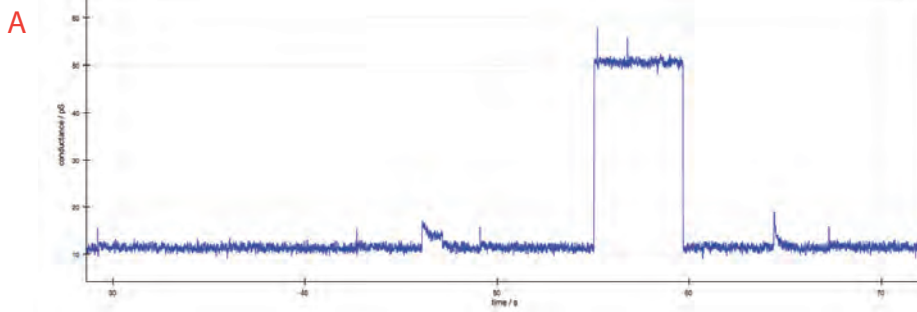
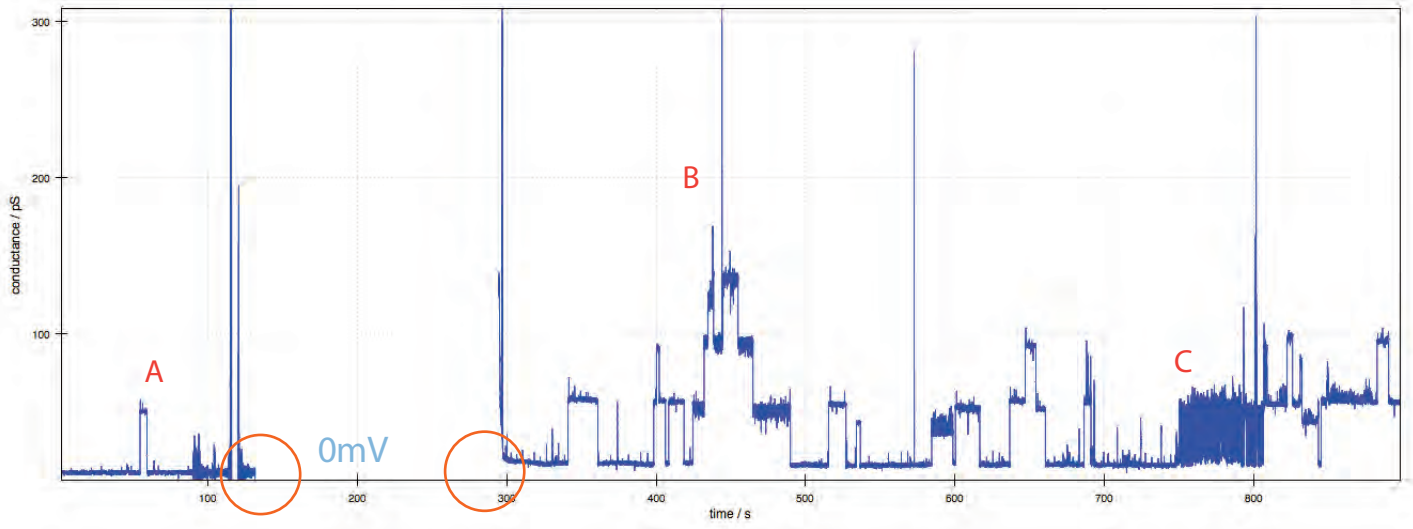


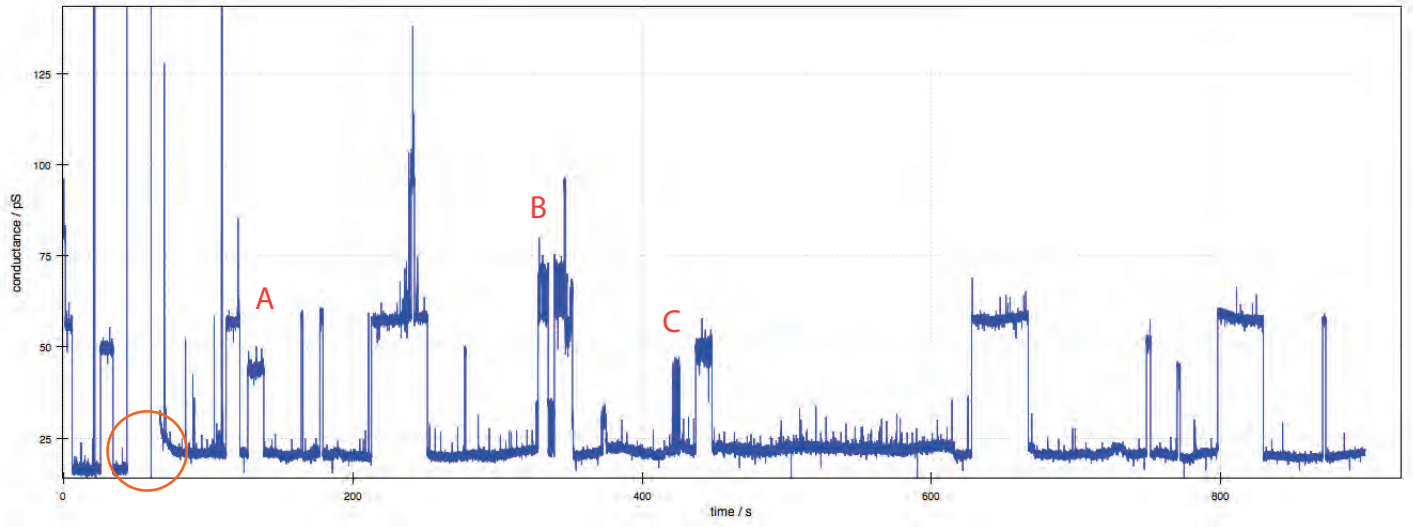
66-0004



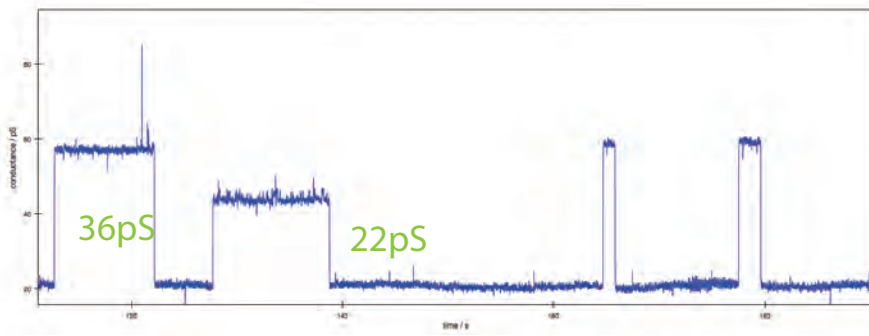




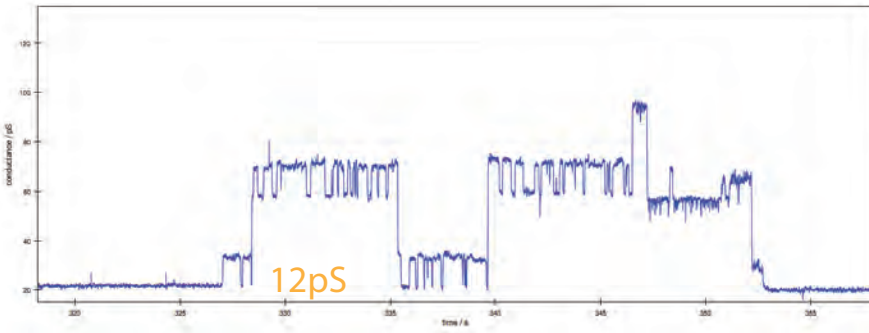




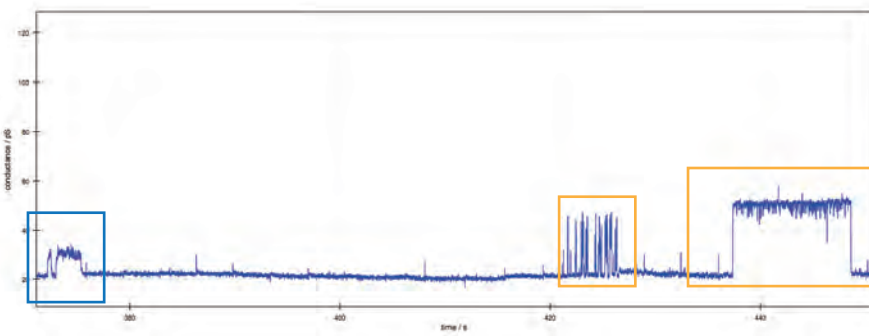
A



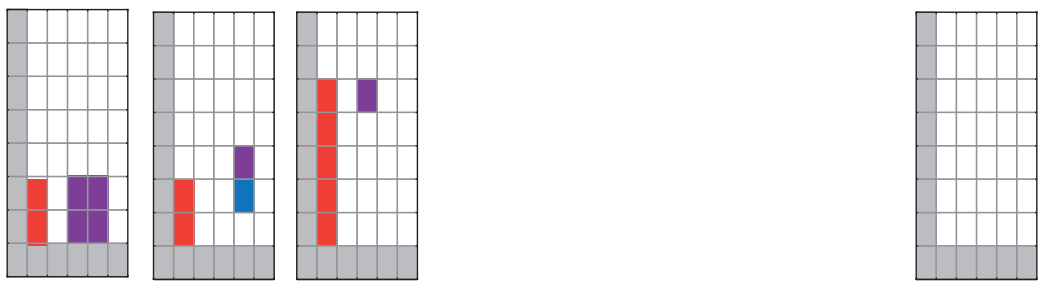
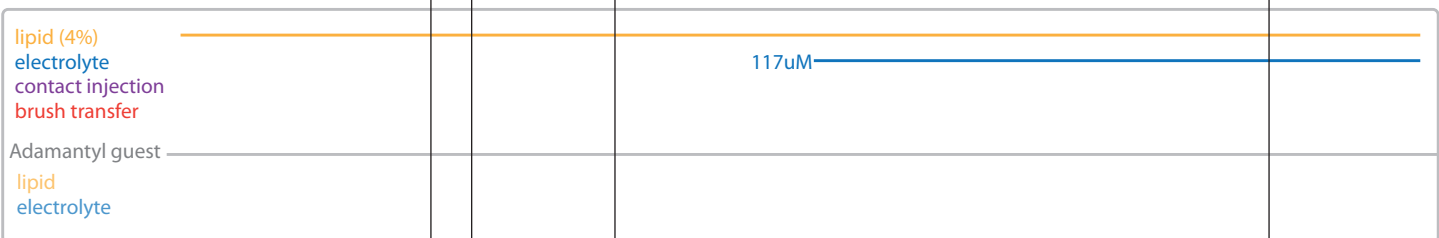
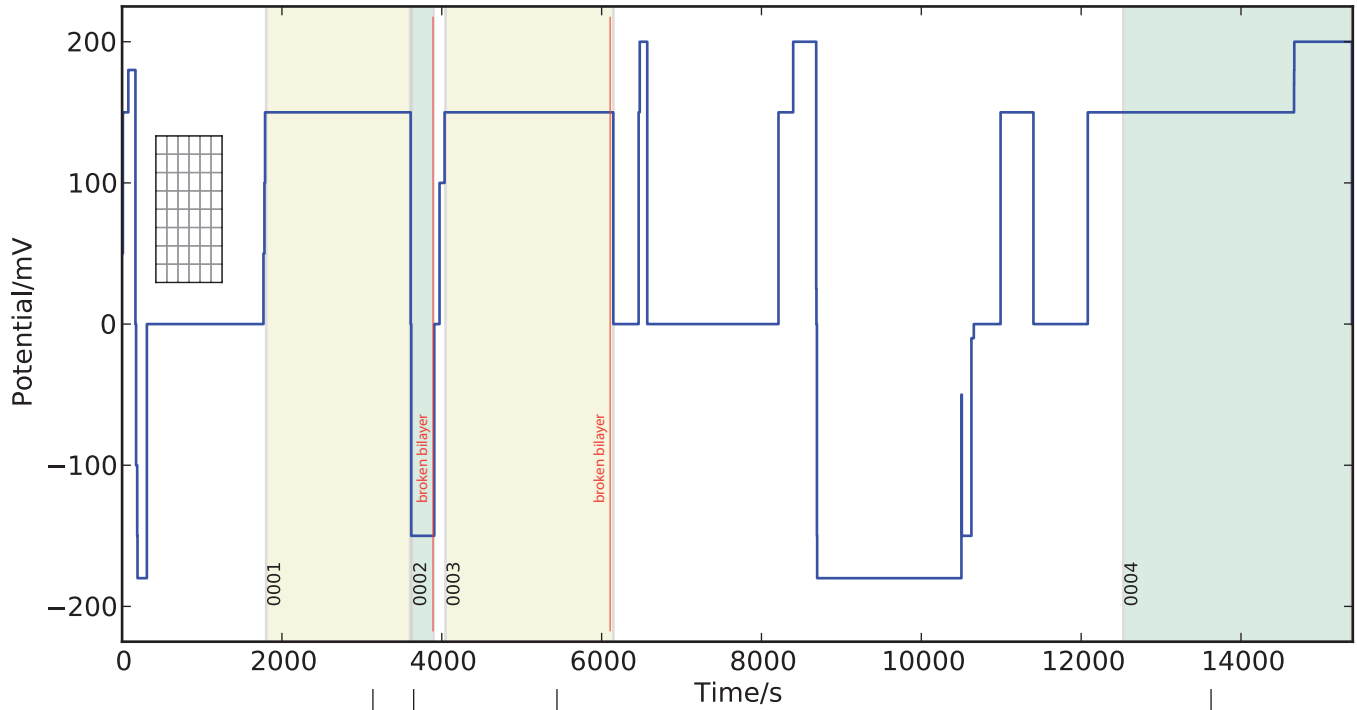
B



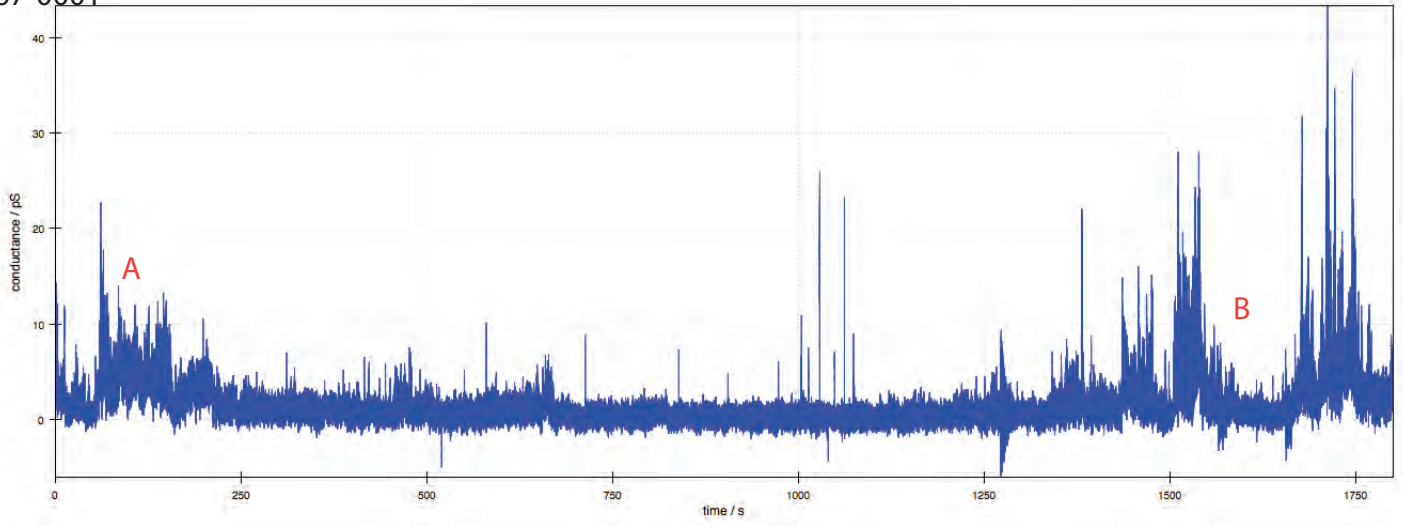
C



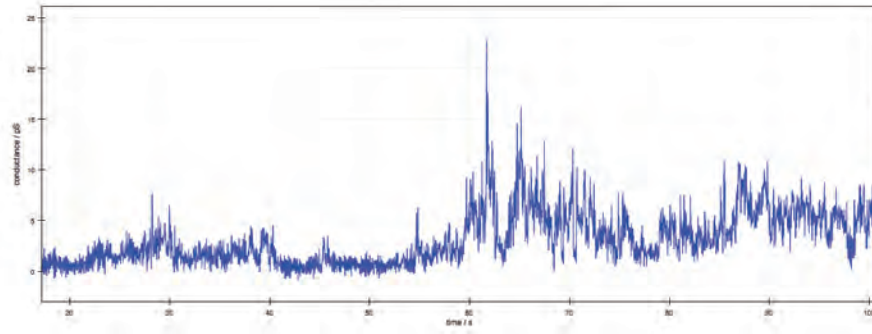
[JC-67] bCD-6N4 - 1M CsCl unbuffered 4percent



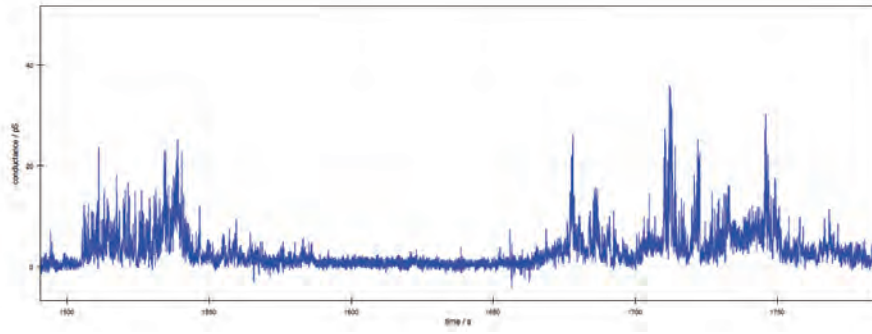
67-0001



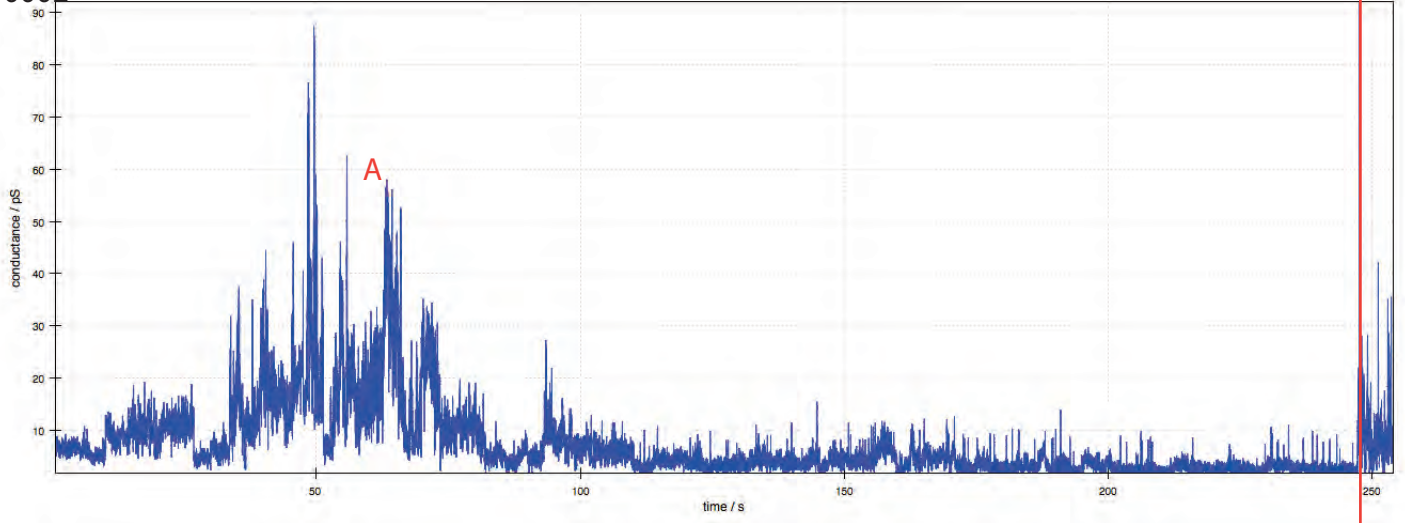
A



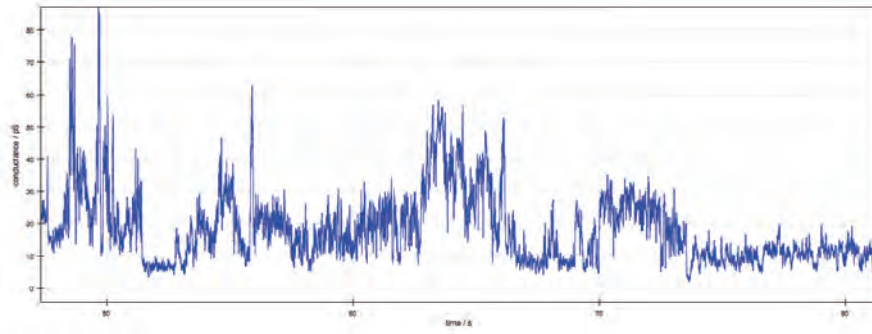
B



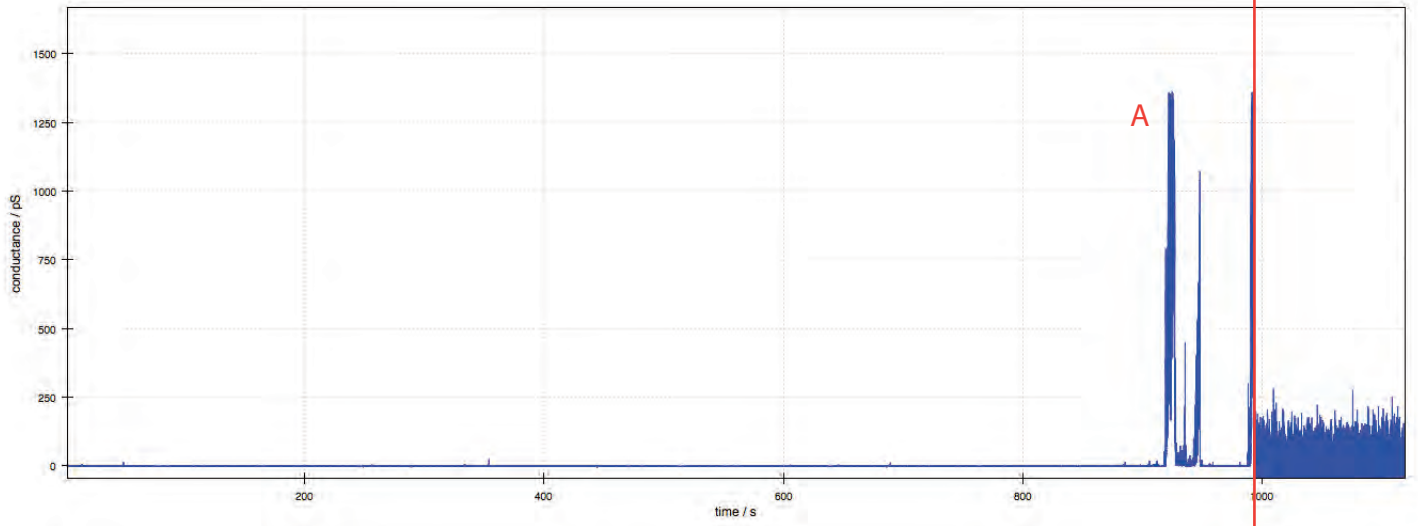
67-0002



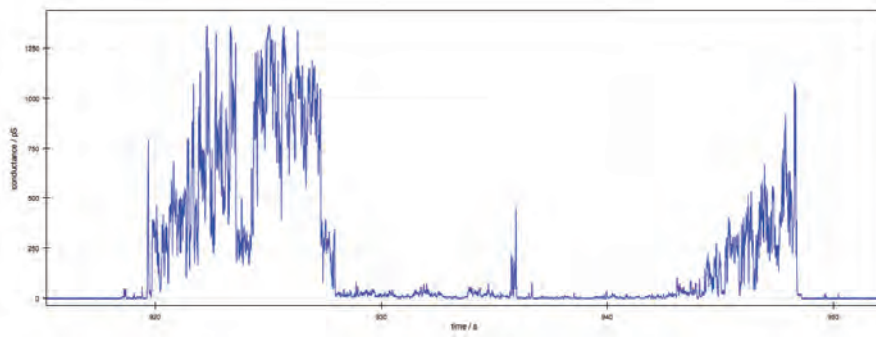
A



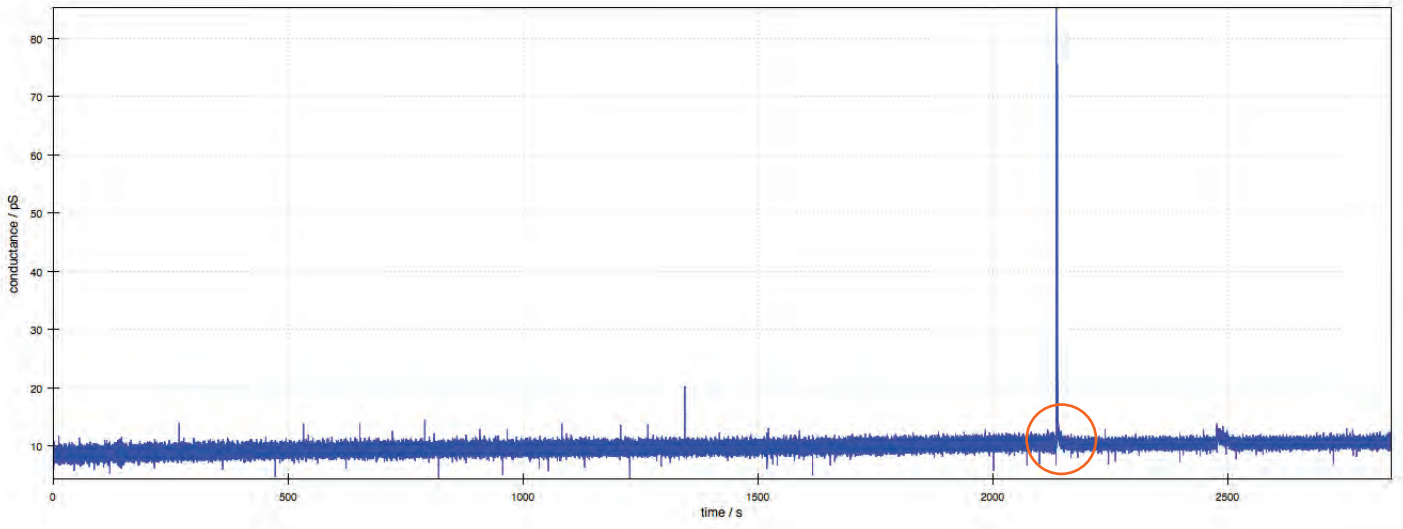
67-0003



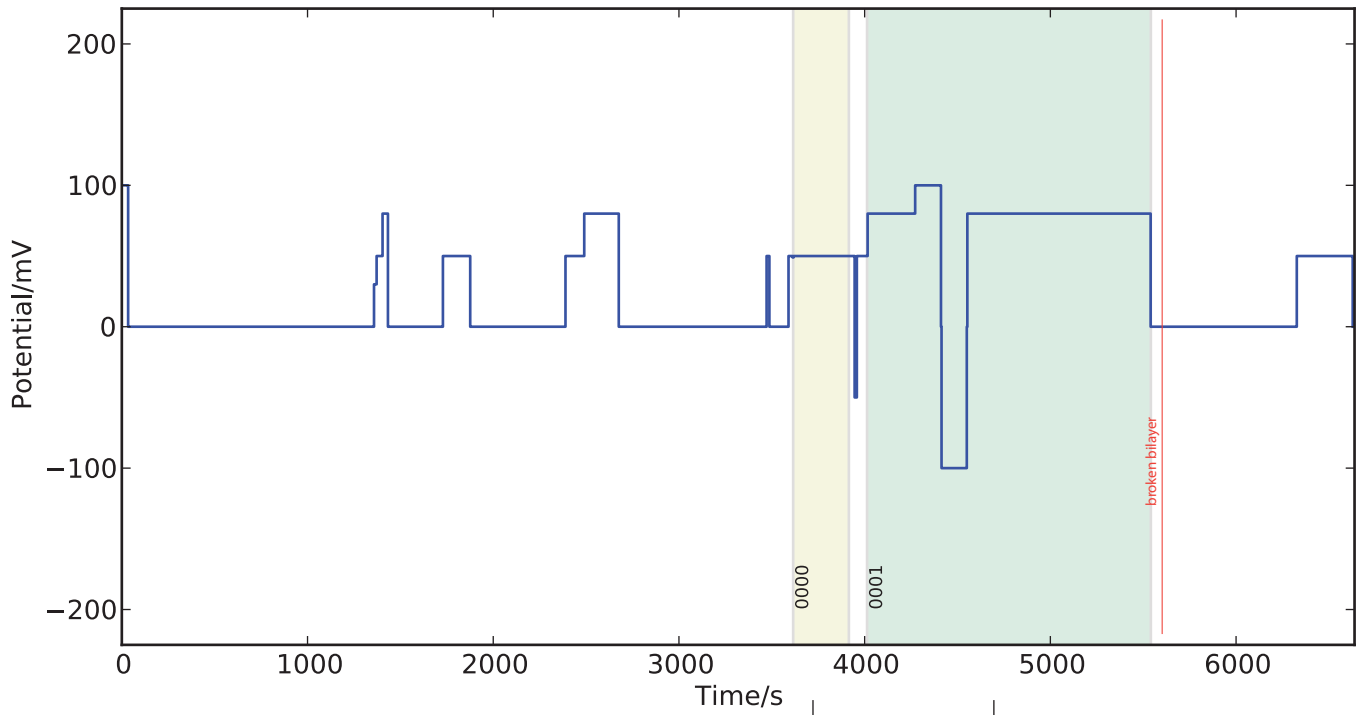
A



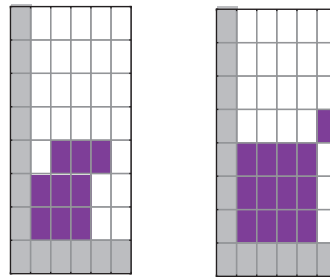
67-0004



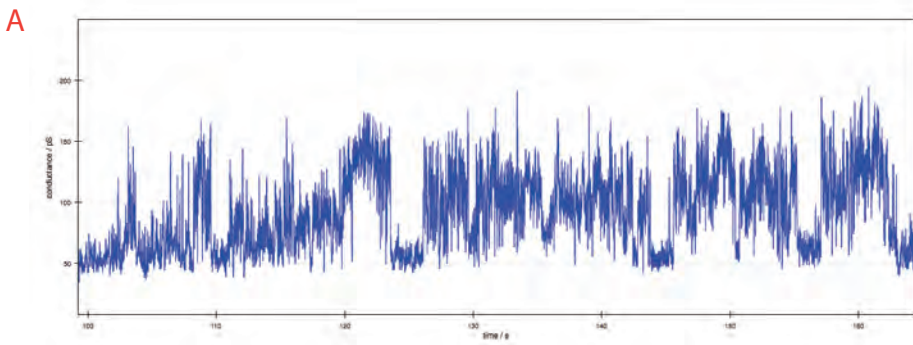
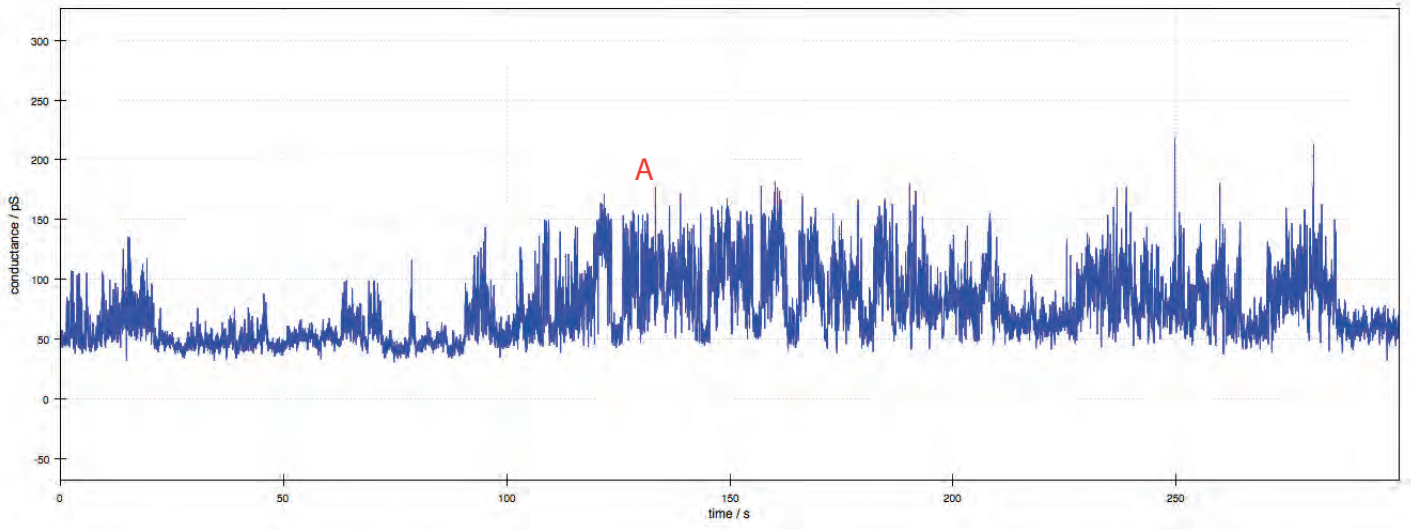
[JC-80] bCD6Am4 1M CsCl pH 7 homoAdd



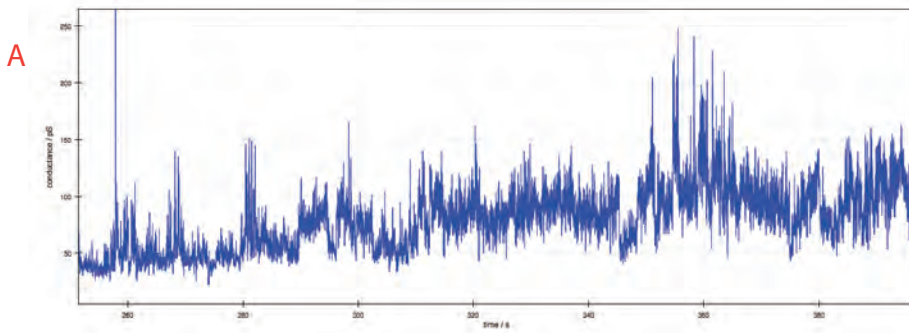
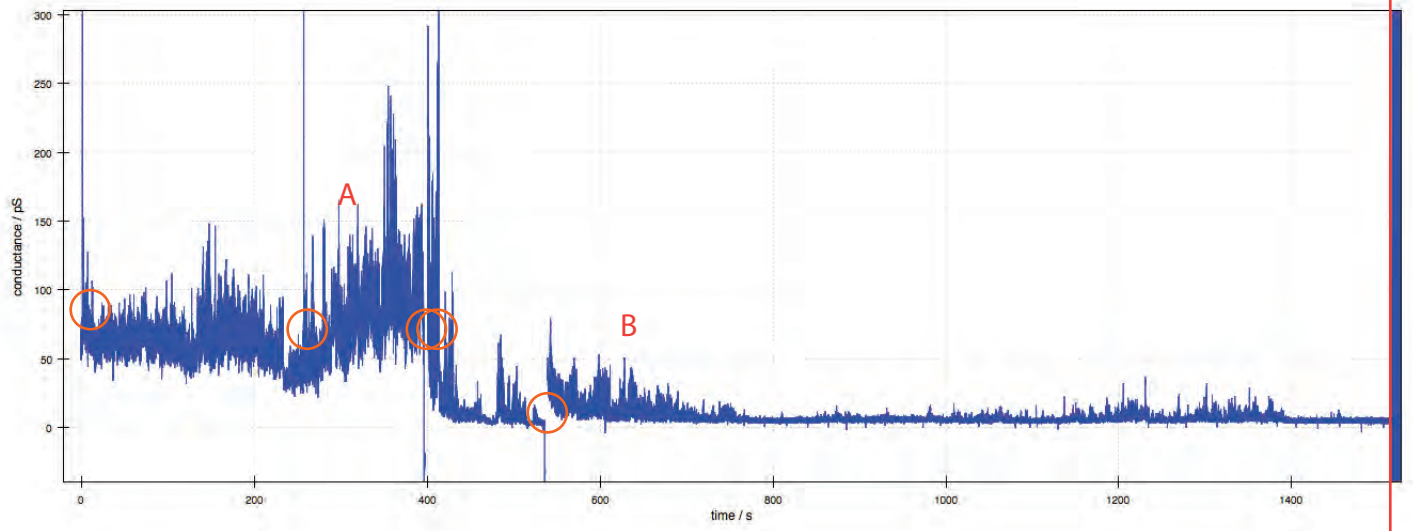
lipid
electrolyte 15/10uM
contact injection
brush transfer



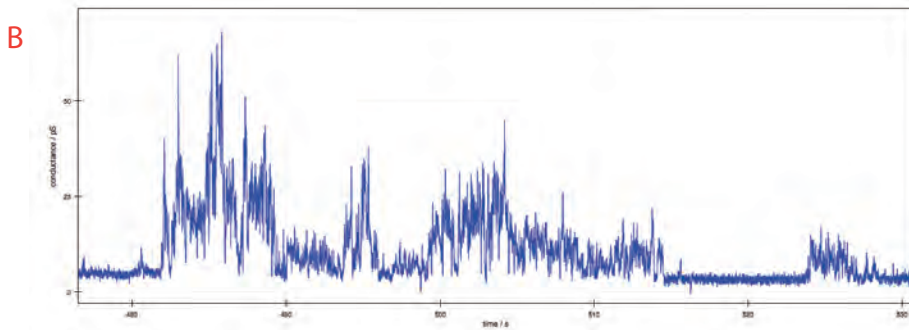
80-0000



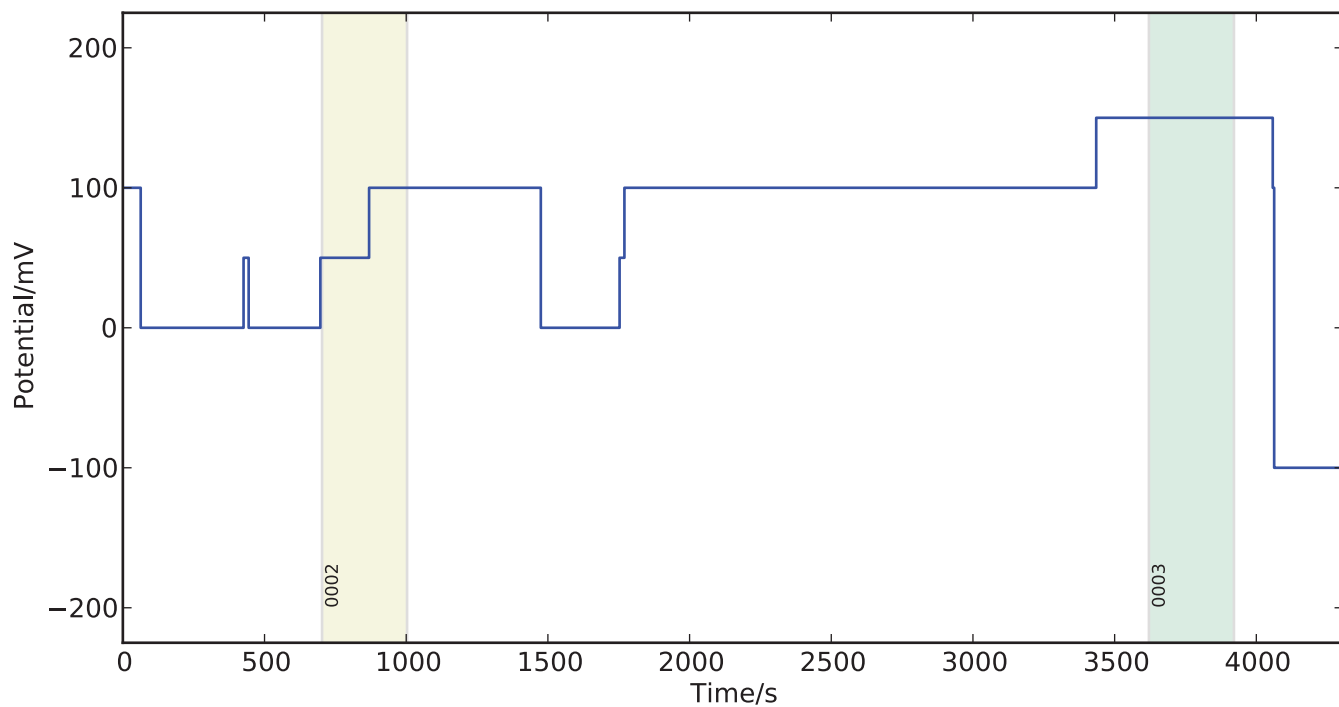
80-0001



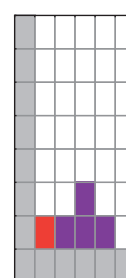
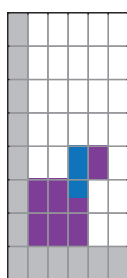
fractal?

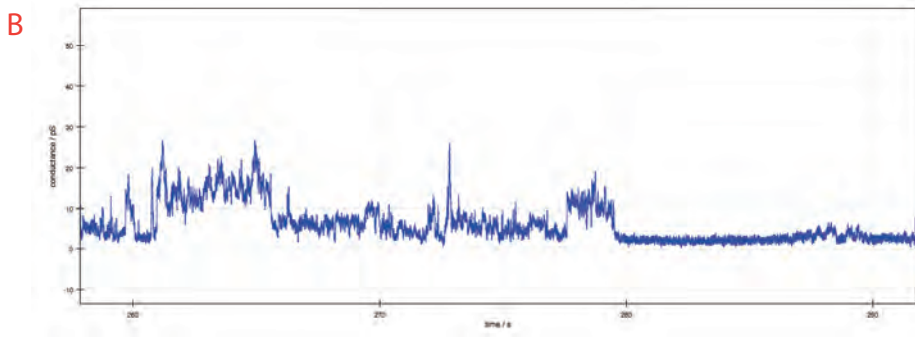
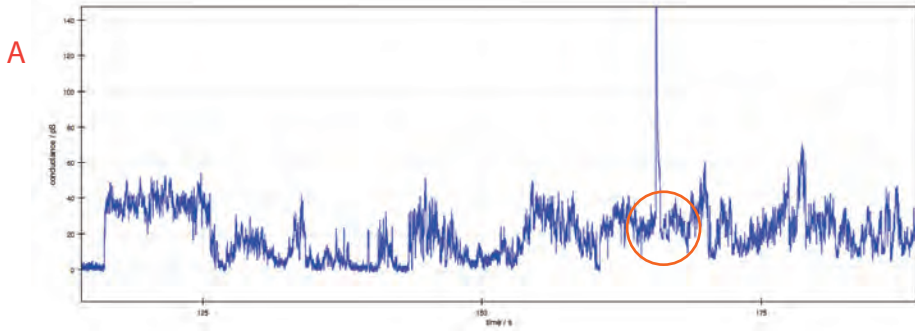
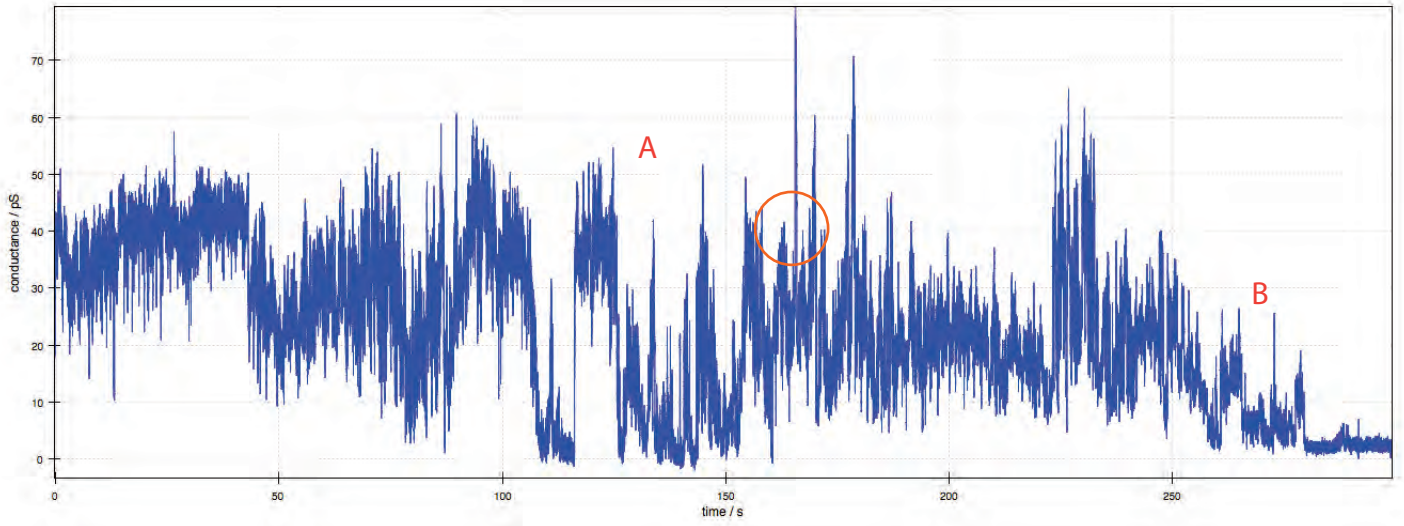


[JC-90] bCD6Am4 1M CsCl pH 7 homoAdd (5-newDiPhPC)

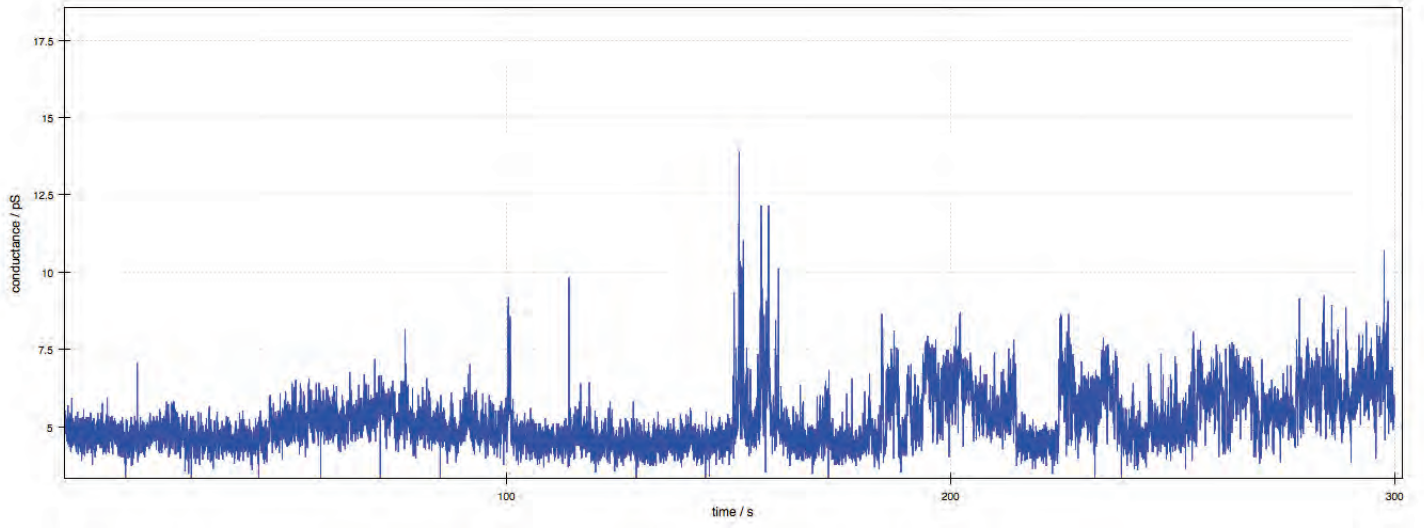


lipid
electrolyte 17/24uM
contact injection
brush transfer

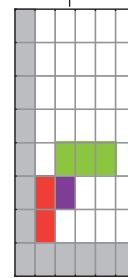
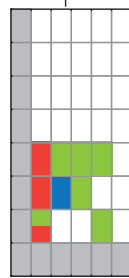
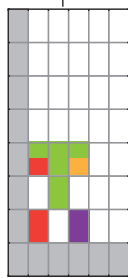
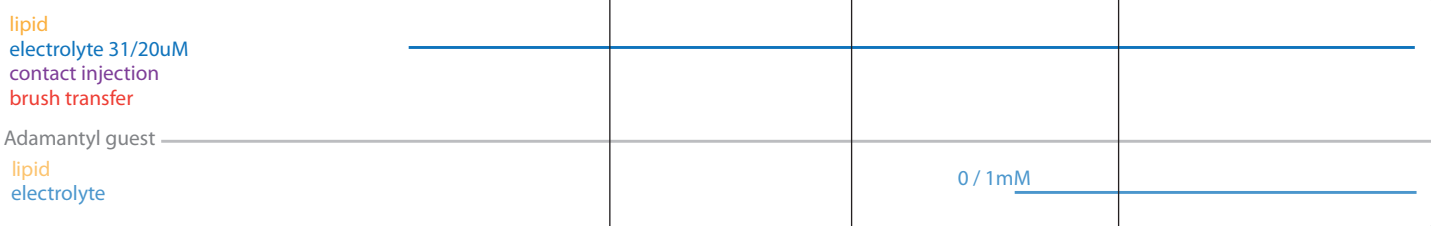
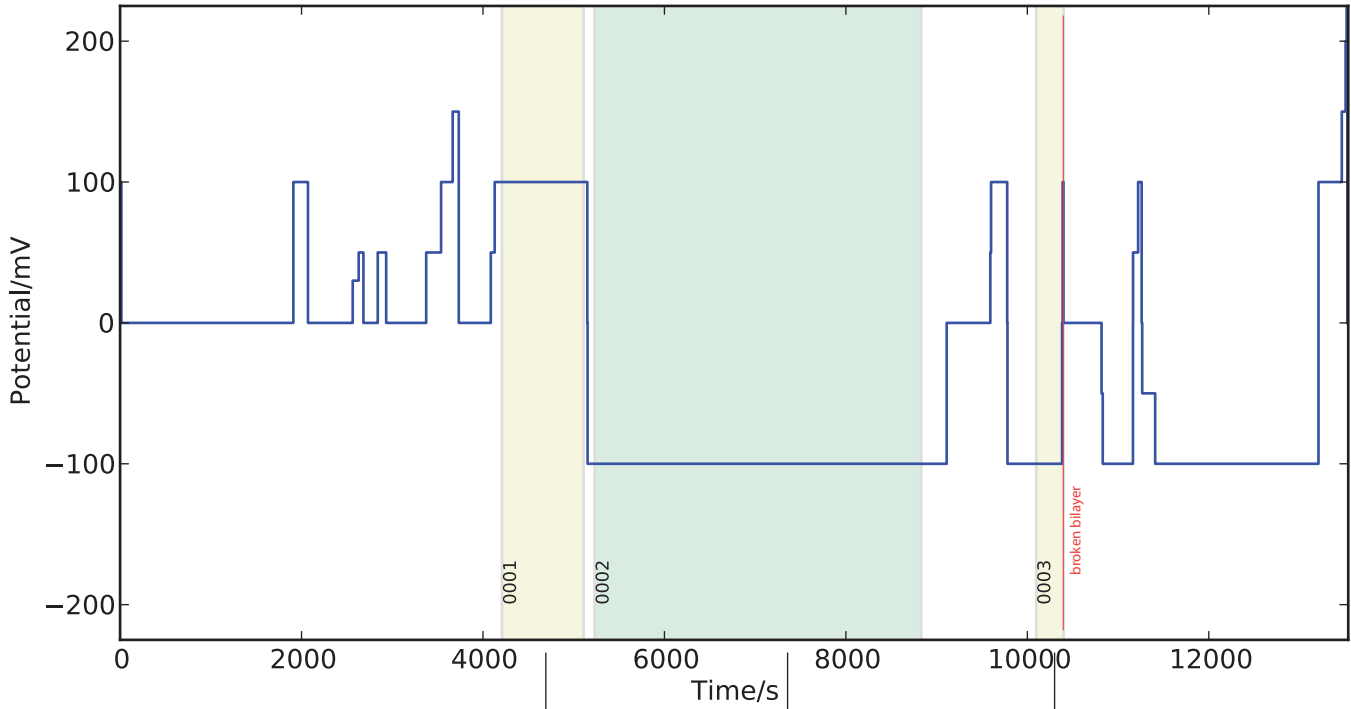




90-0003

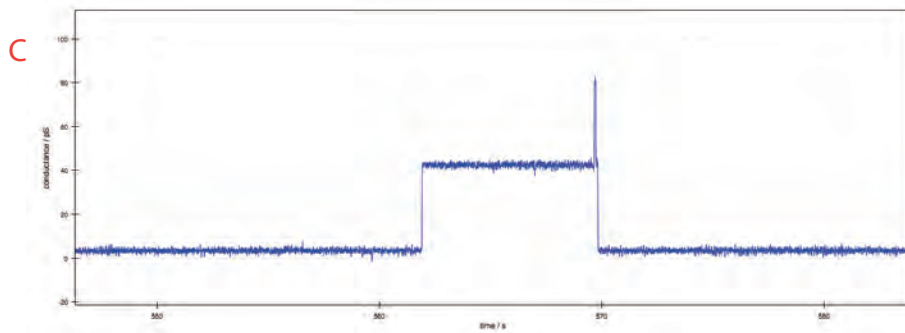
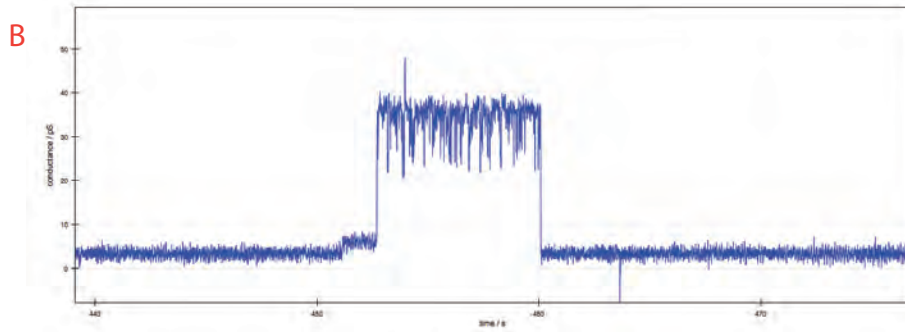
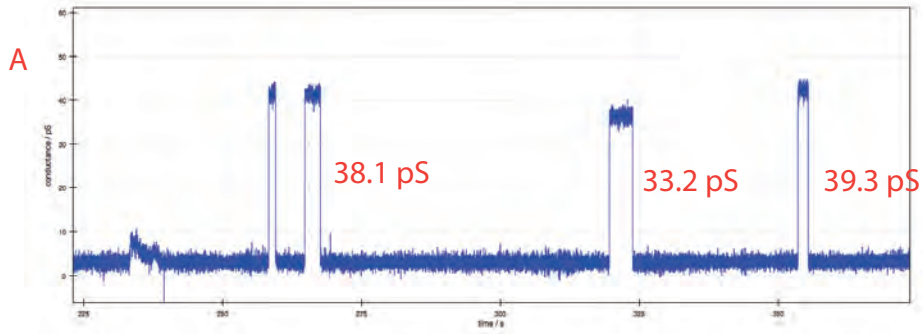
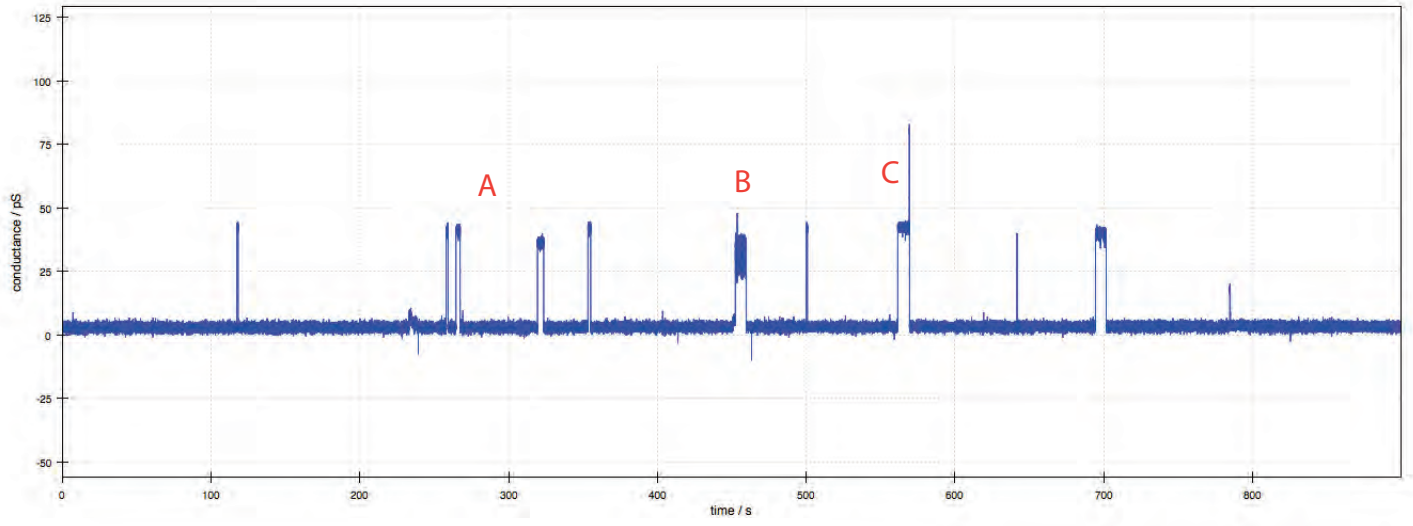


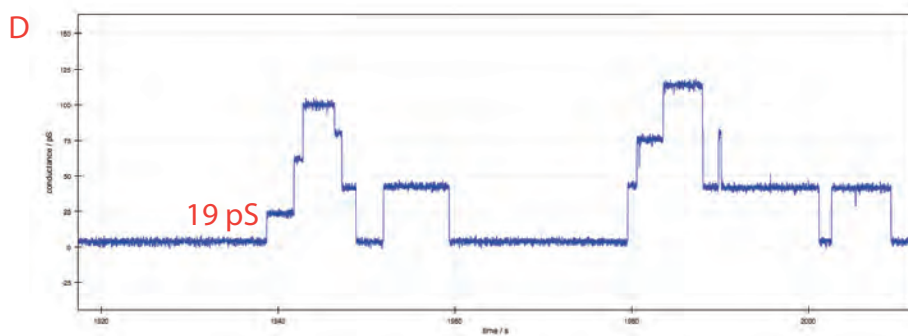
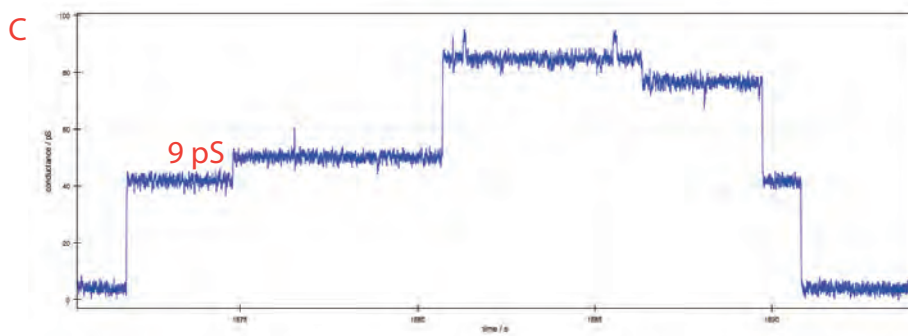
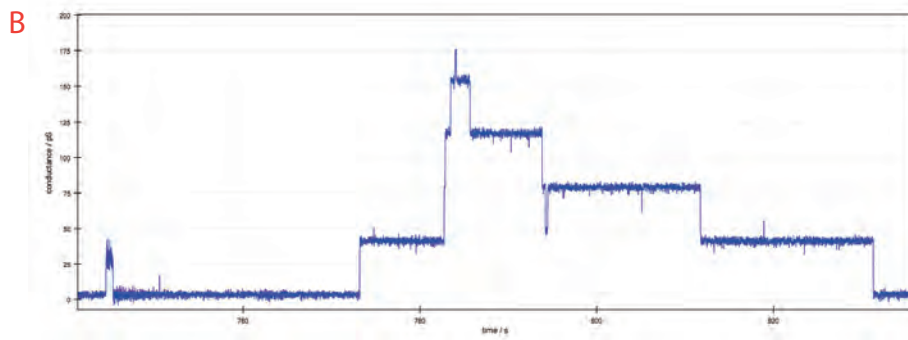
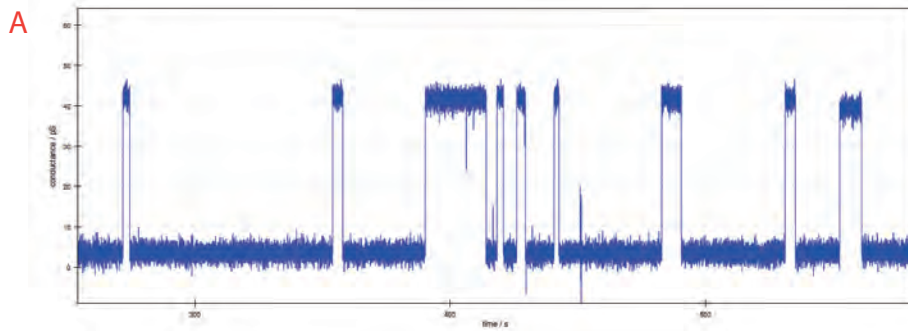
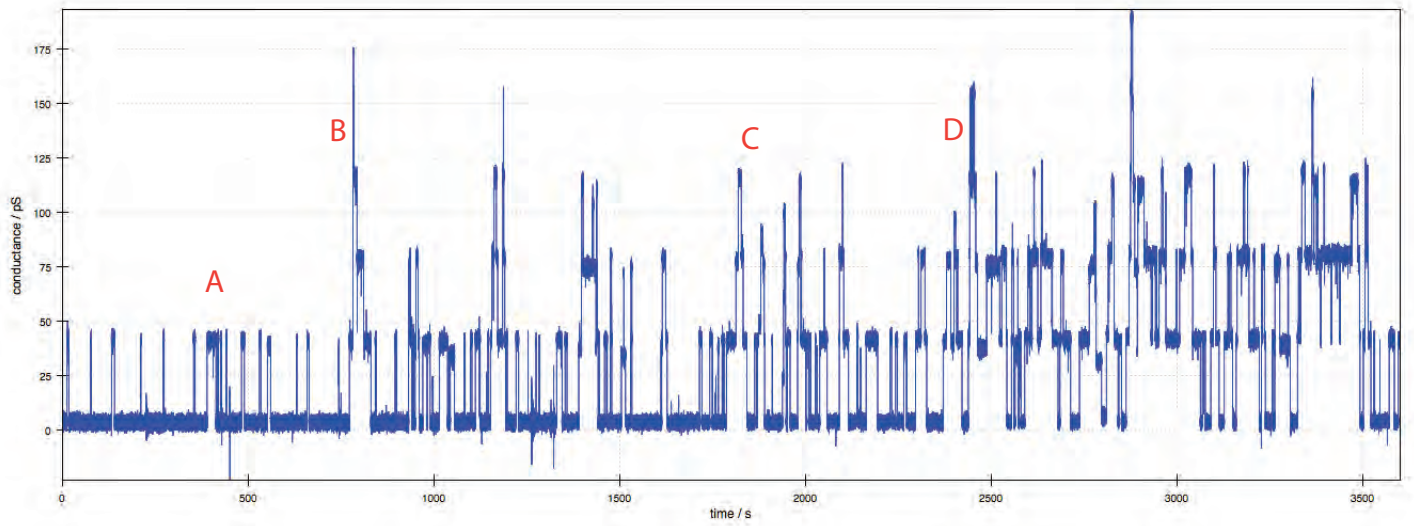
[JC-93] bCD6EsF4 1M CsCl pH 7 homoAdd (5-newDiPhPC)



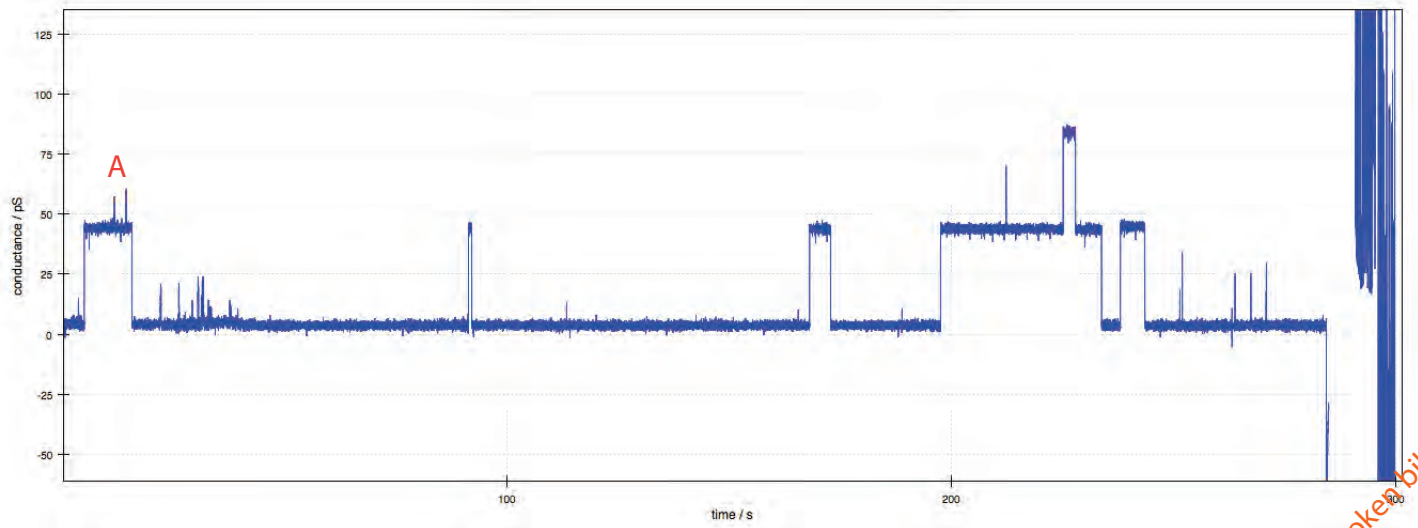
simultaneous openings seen,
both different and indifferent

ABA*B* seen

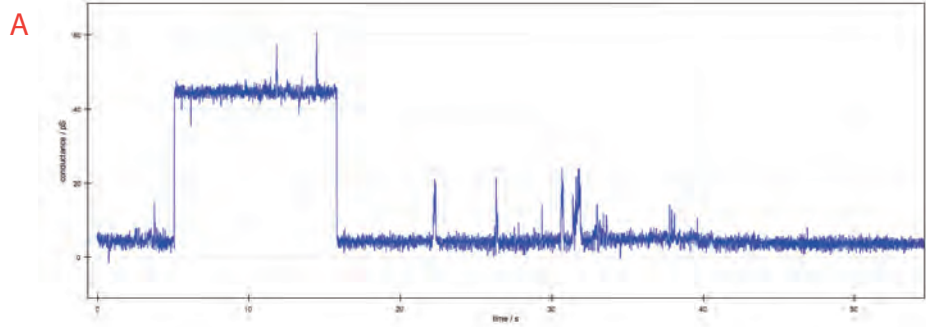




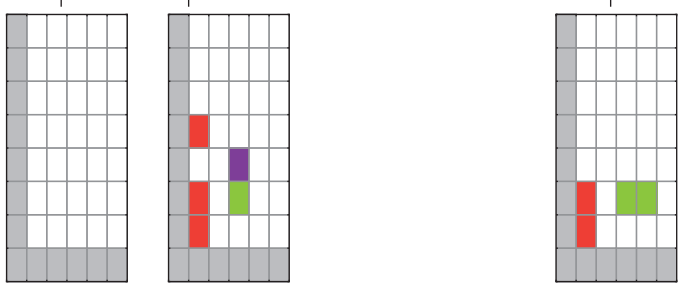
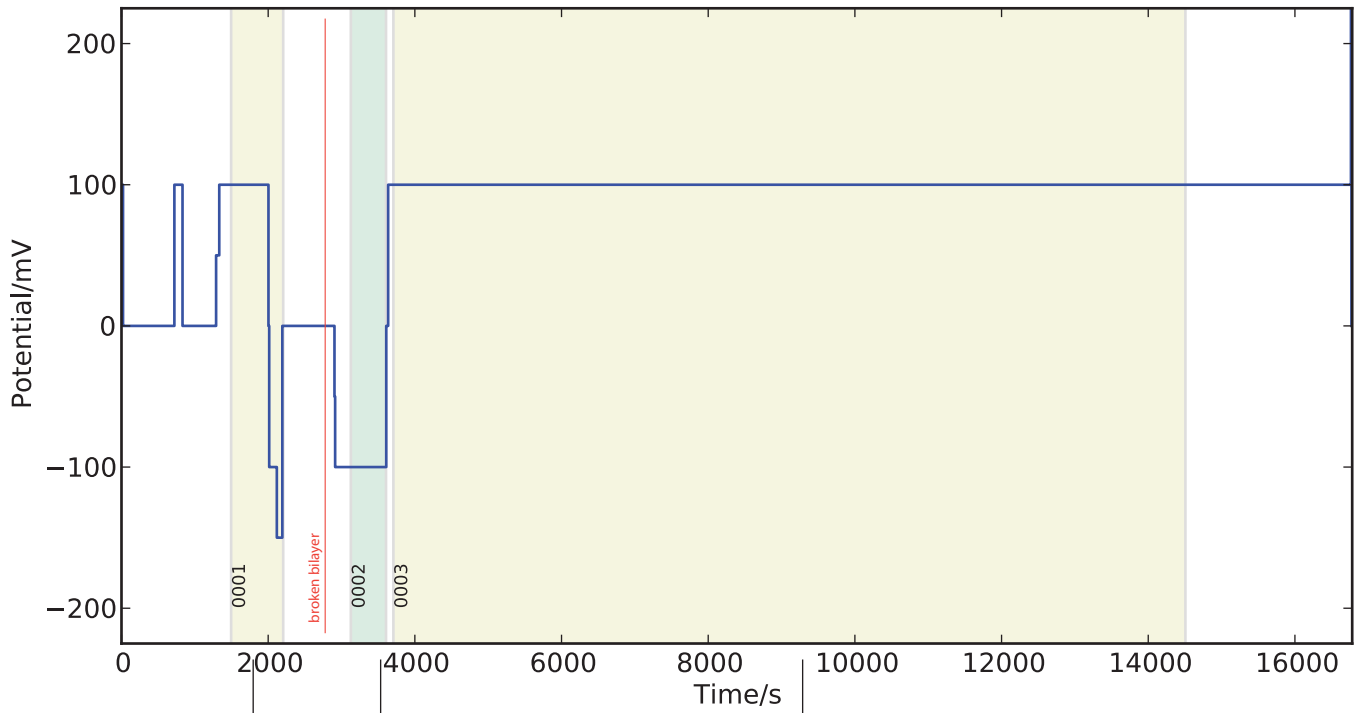
93-0003



broken bilayer



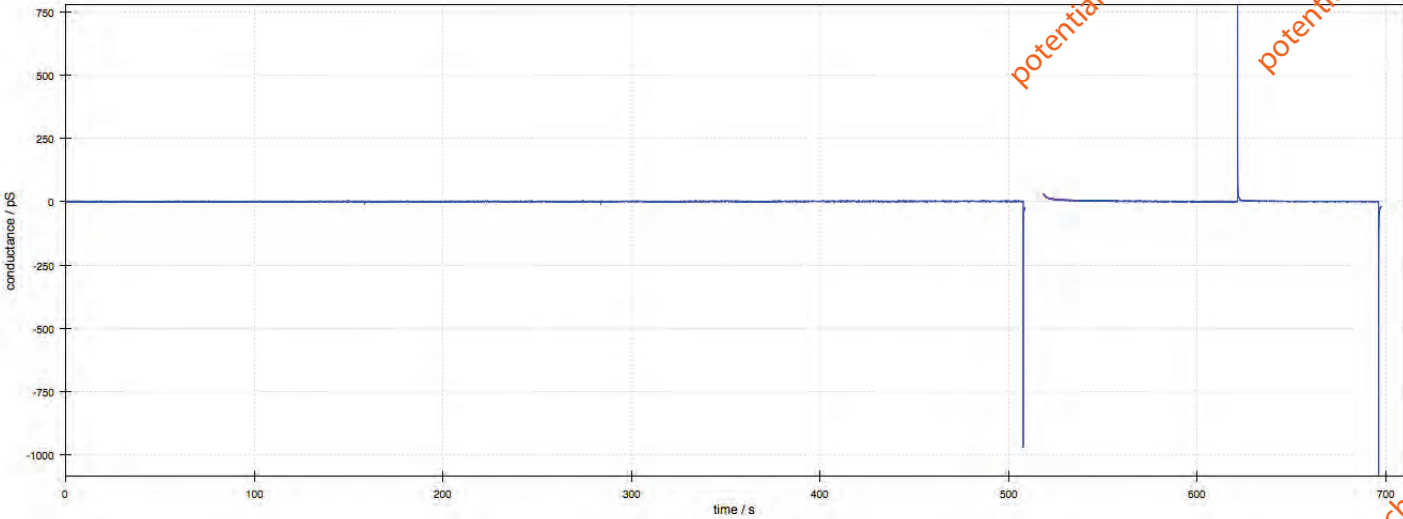
[JC-94] bCD6EsF4 1M KCl pH 7 homoAdd (5-newDiPhPC)



Spontaneously became silent over an hour

Note difference in square-top magnitude from 93 is due to different electrolyte (CsCl vs. KCl)

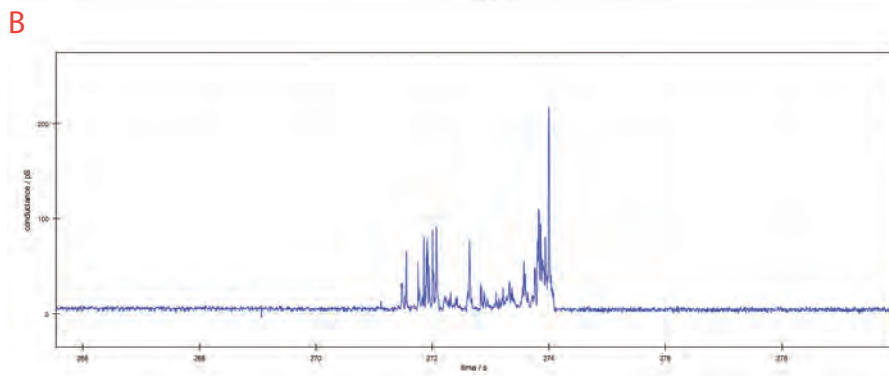
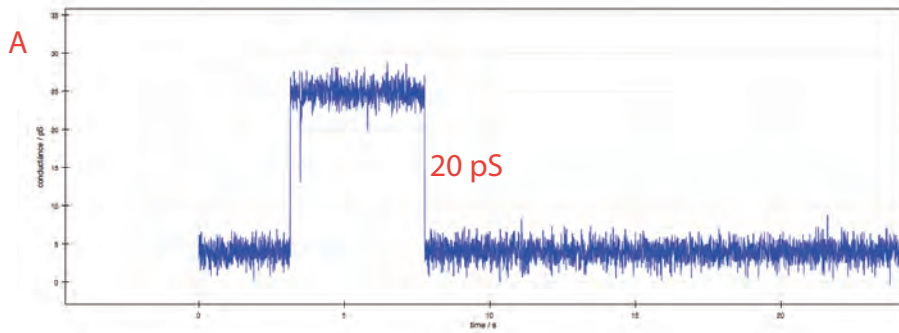
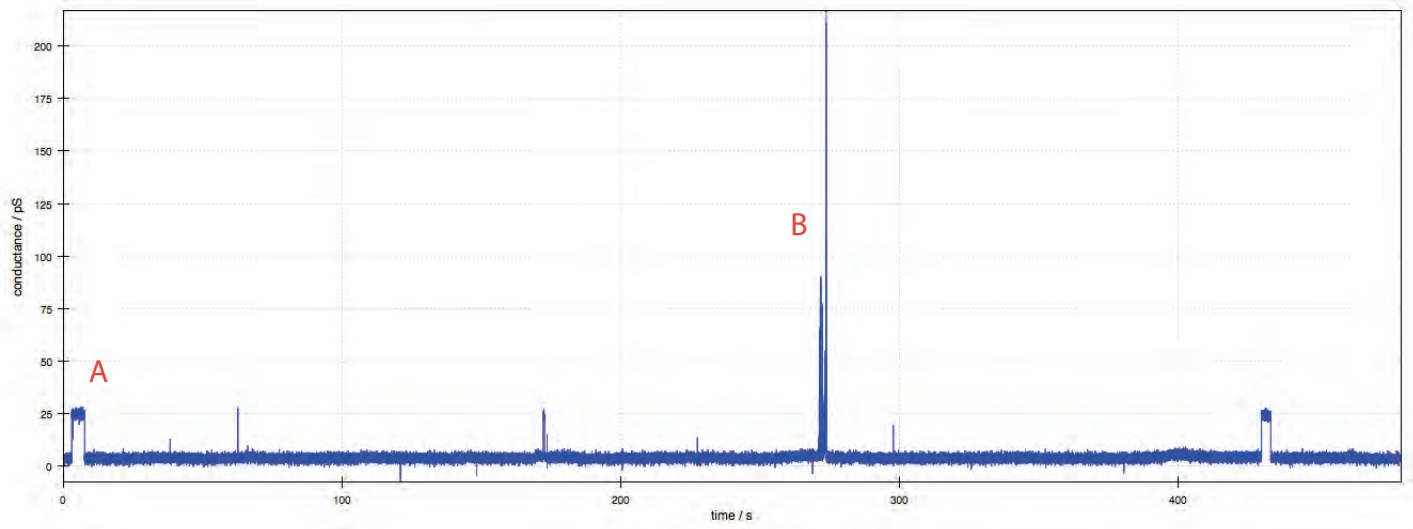
94-0001

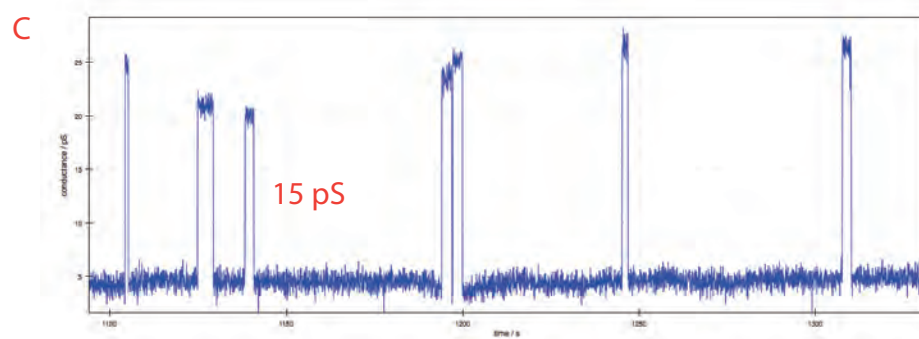
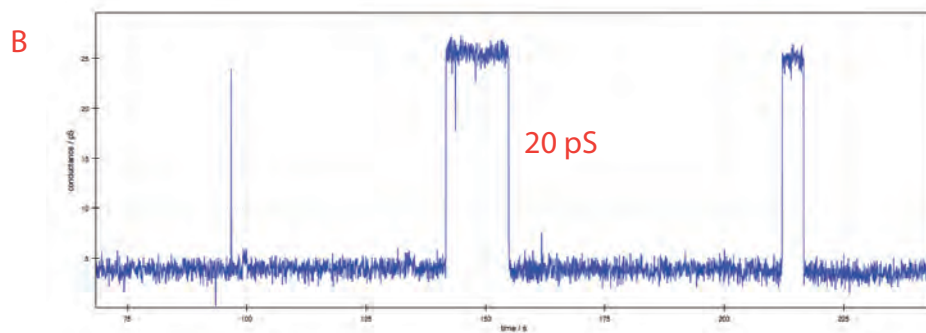
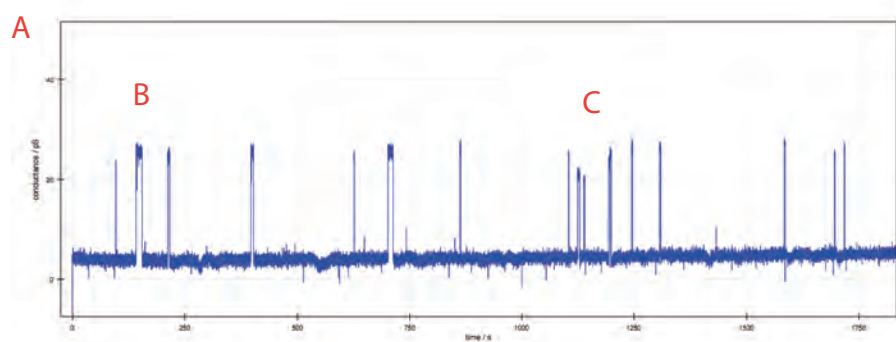
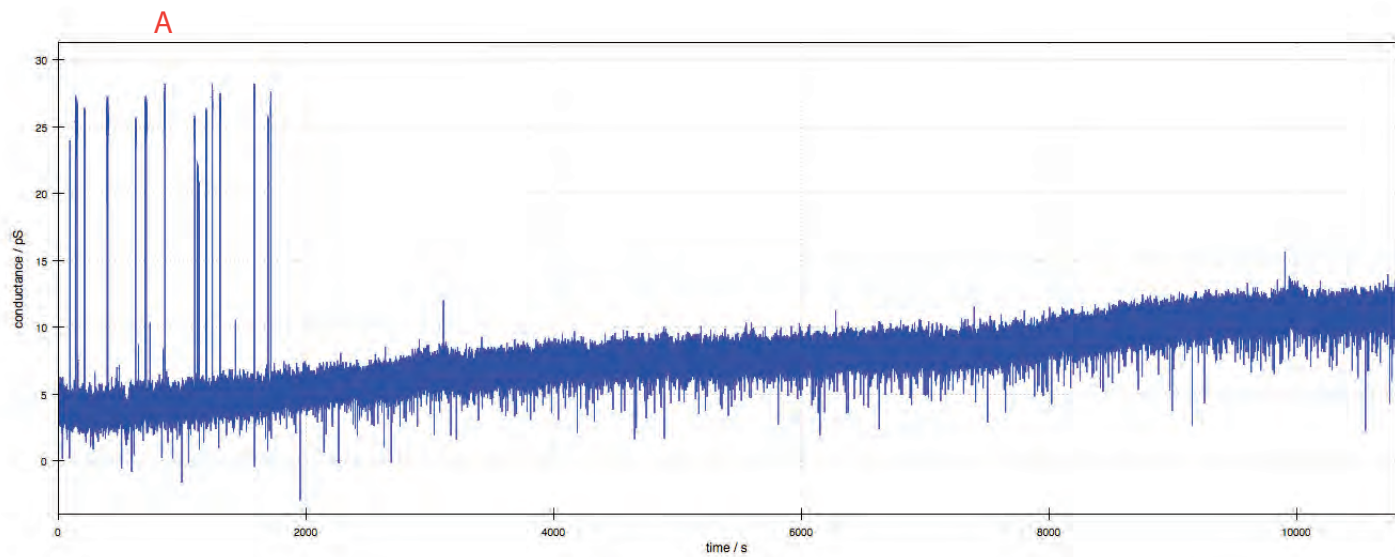


potential change

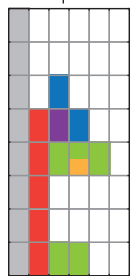
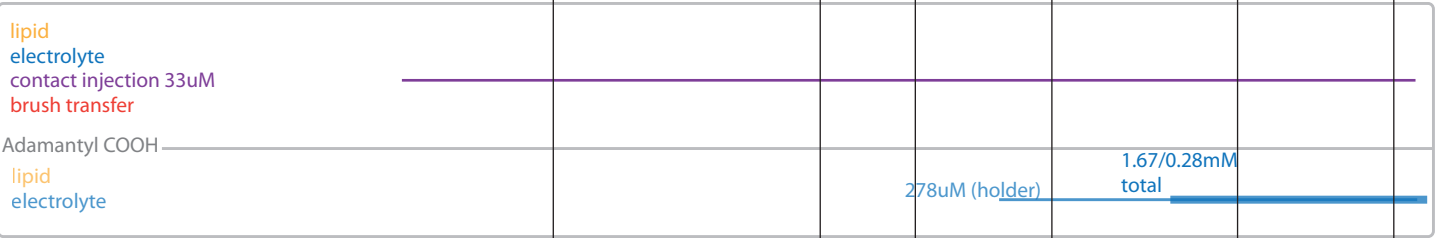
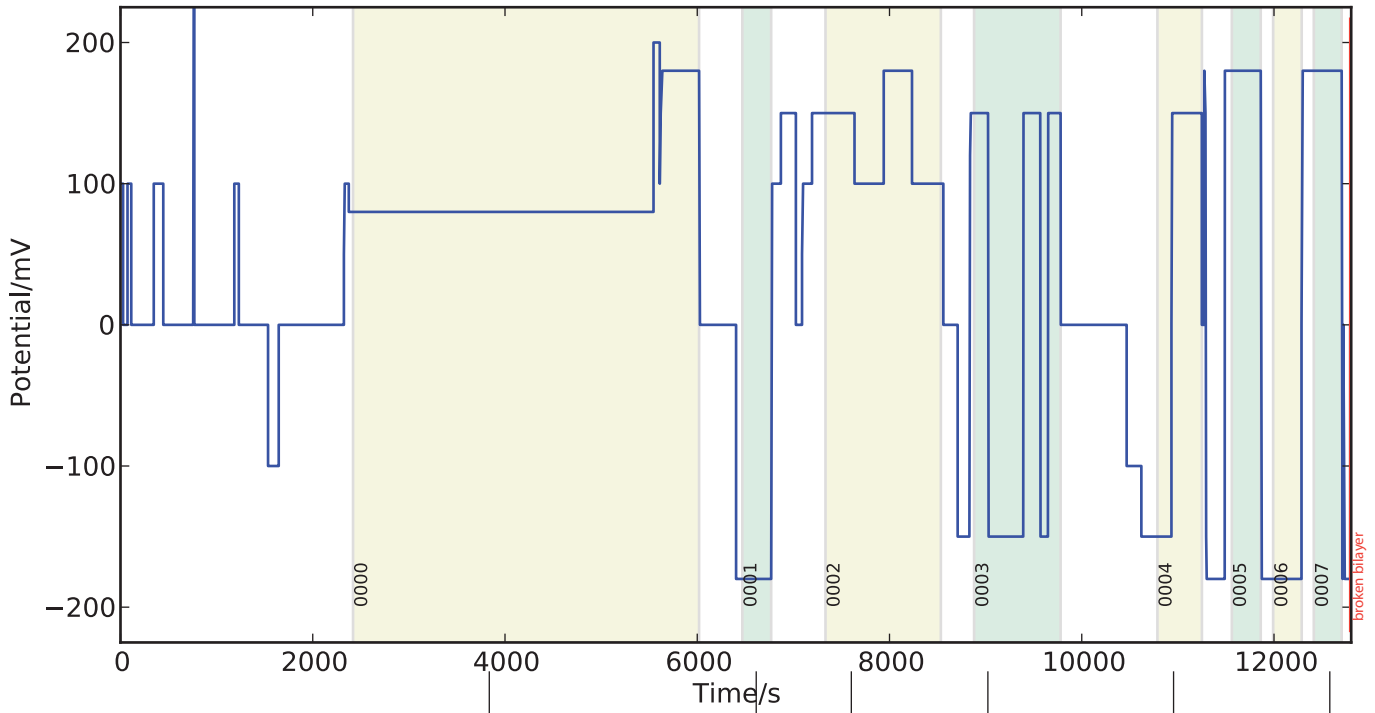
potential change

potential change

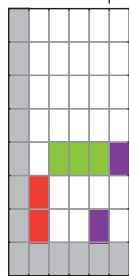




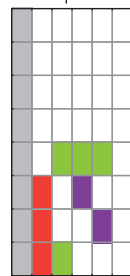
[JC-95] bCD6EsF4 1M CsCl pH 7 homoAdd (AdCOOH block)



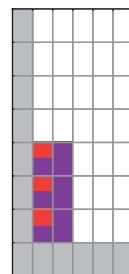
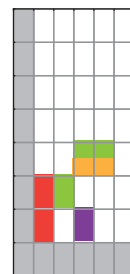
potential dependent?

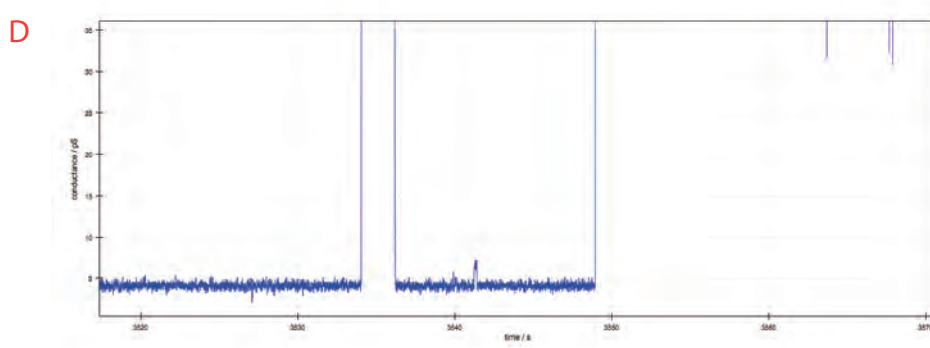
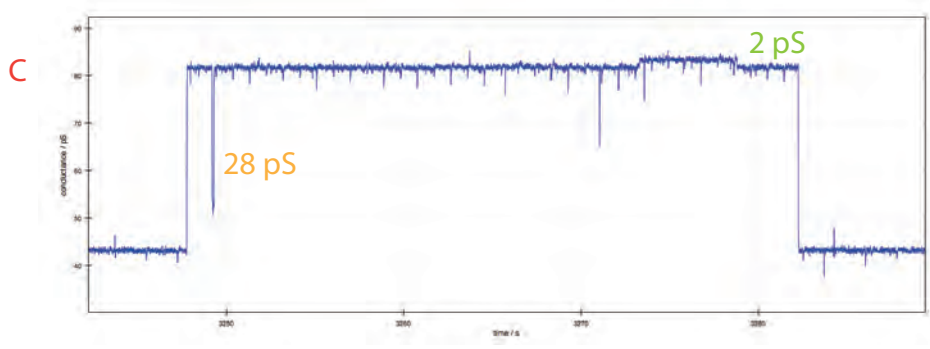
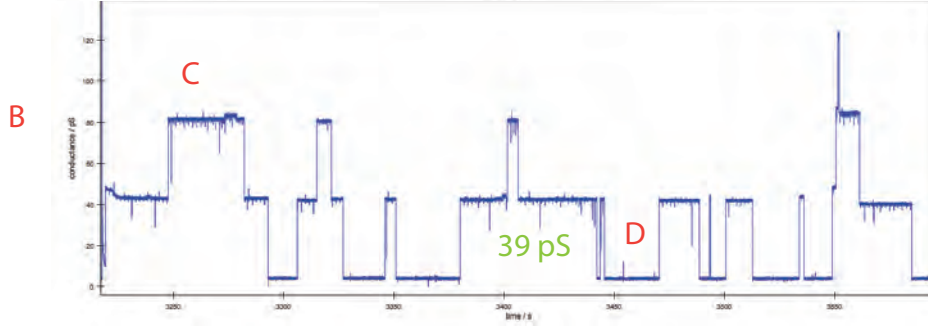
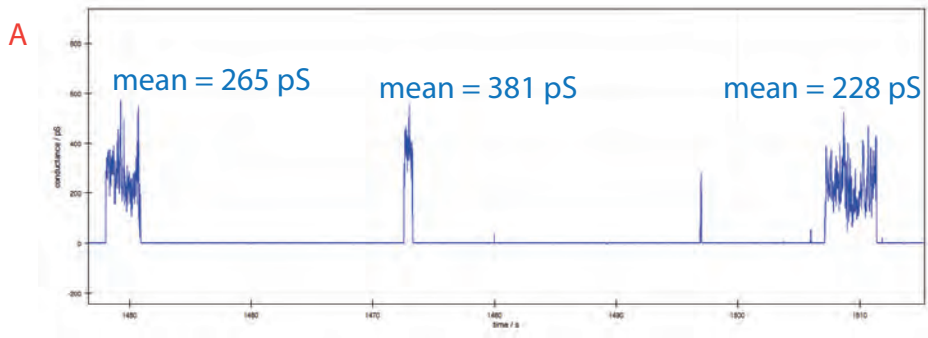
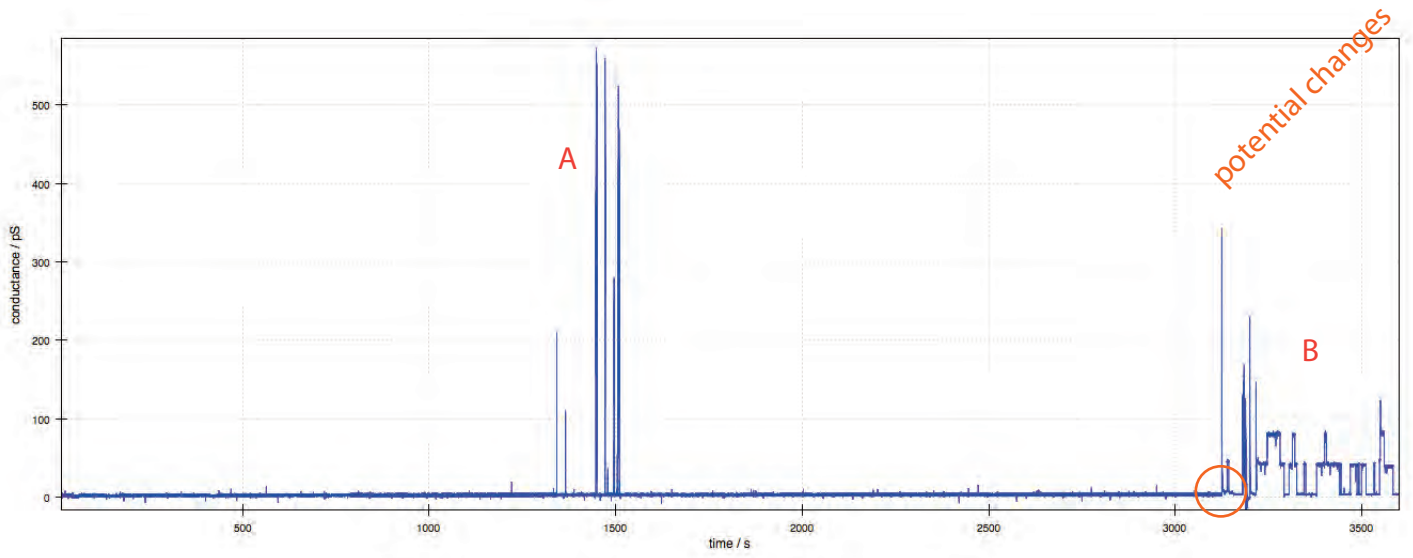


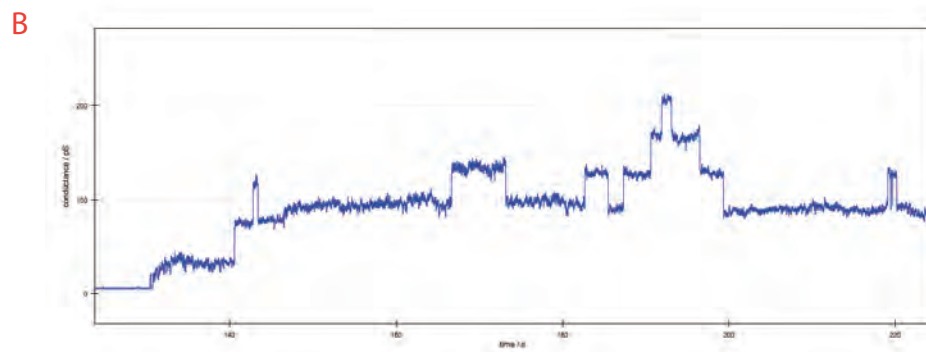
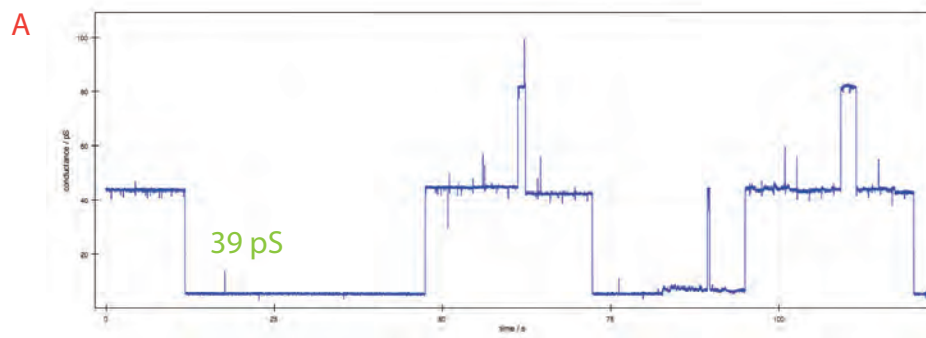
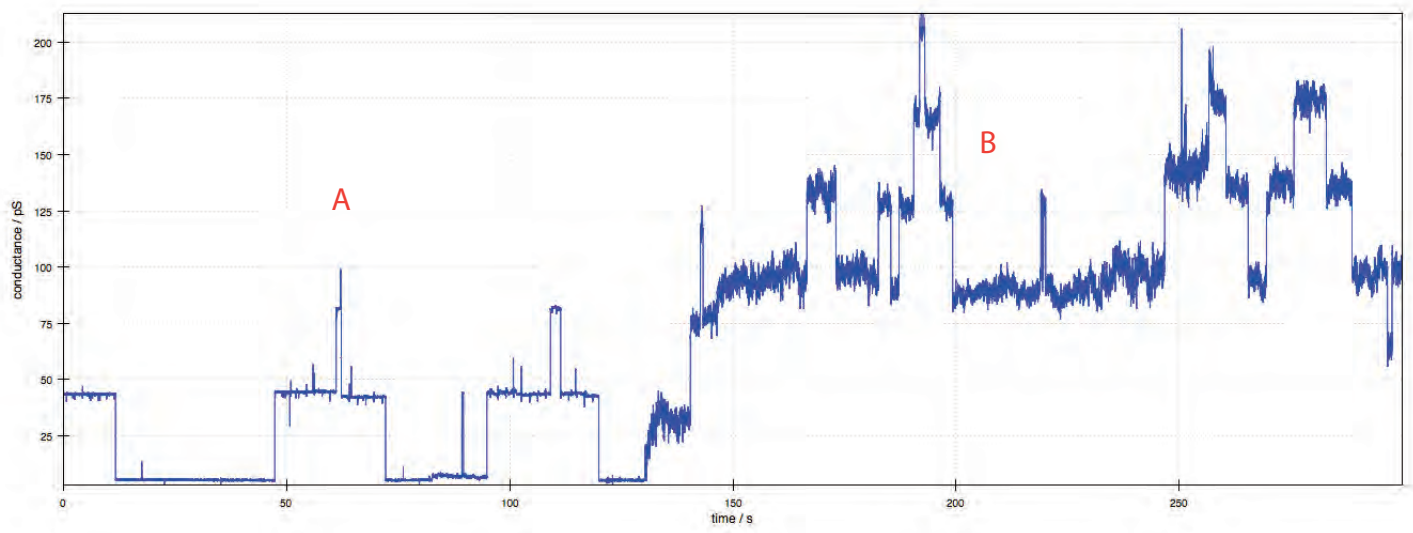
example of suddenly onset noise (or purple)

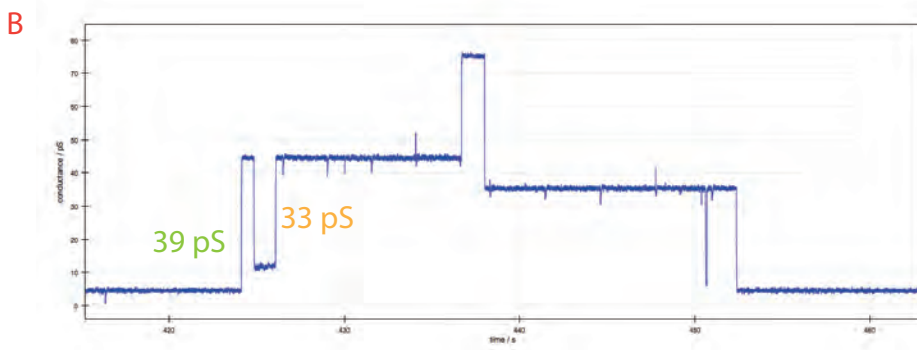
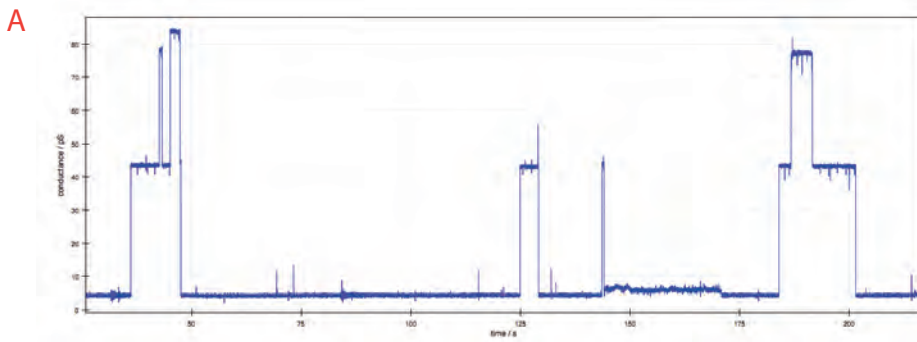
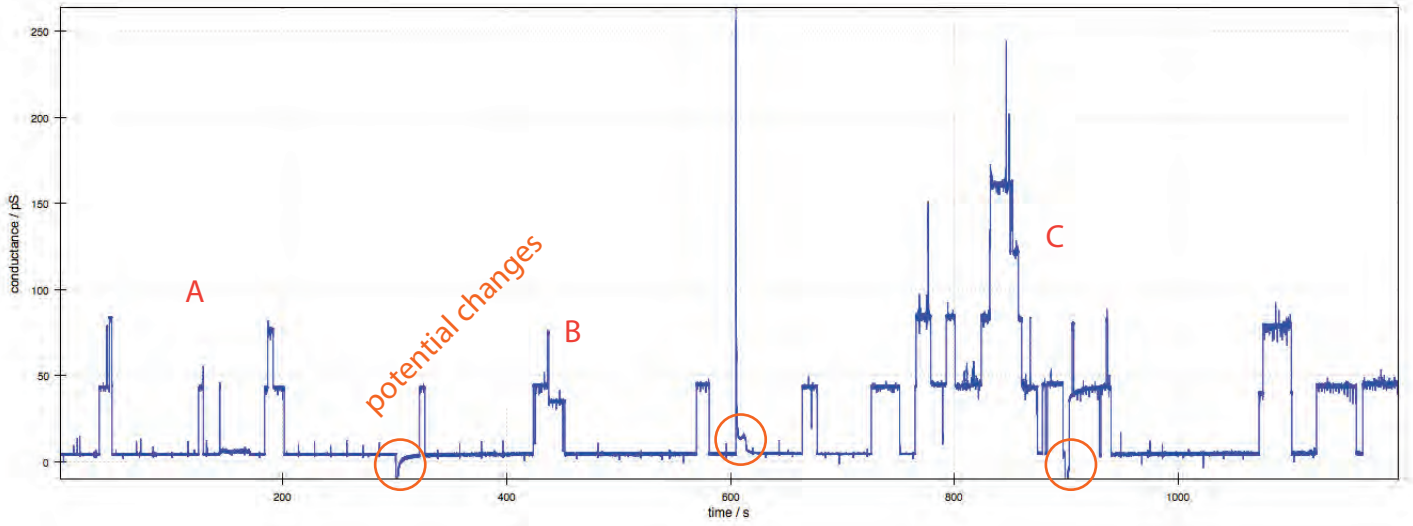


prolonged partial closure

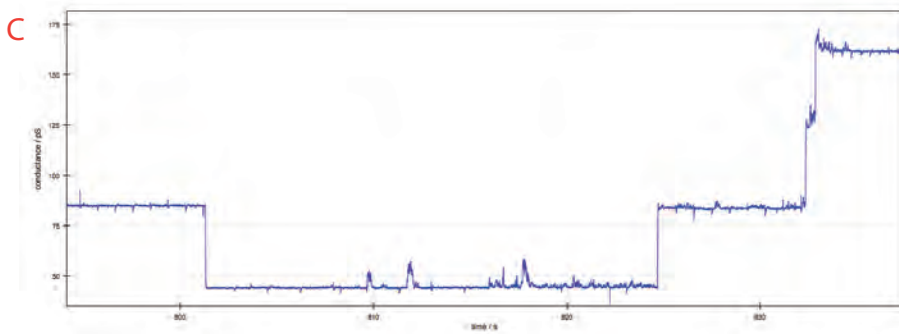


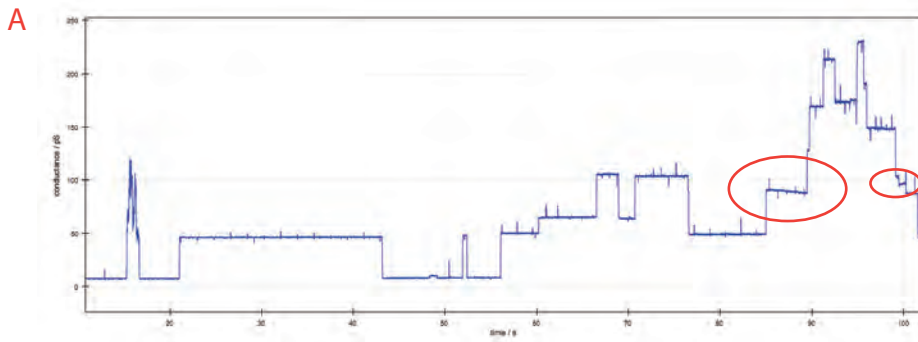
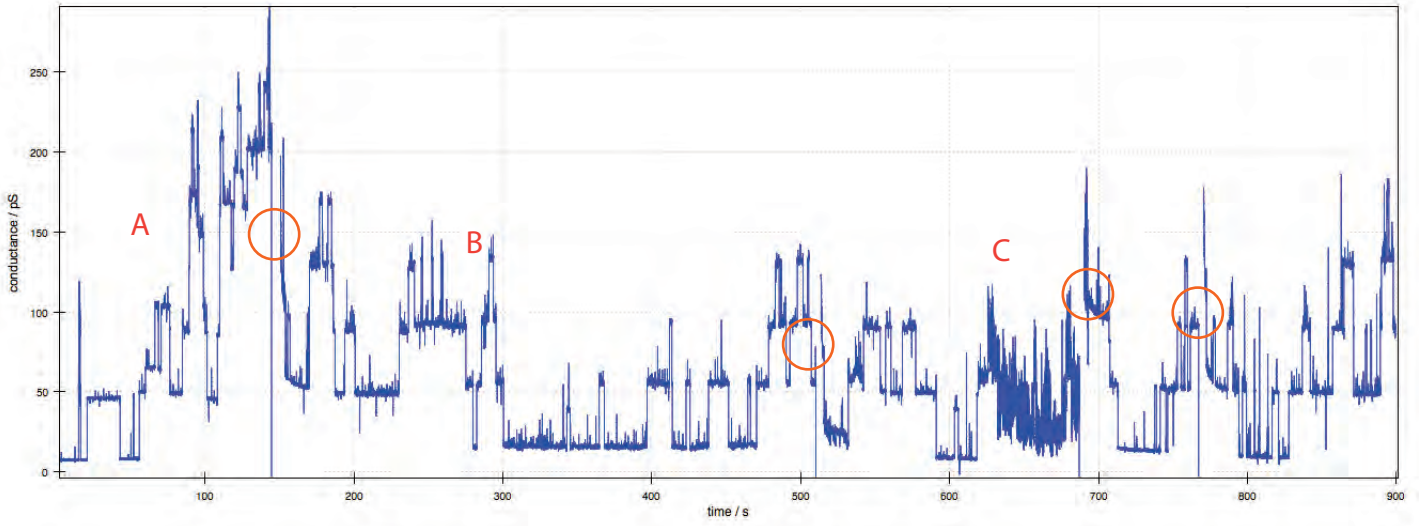




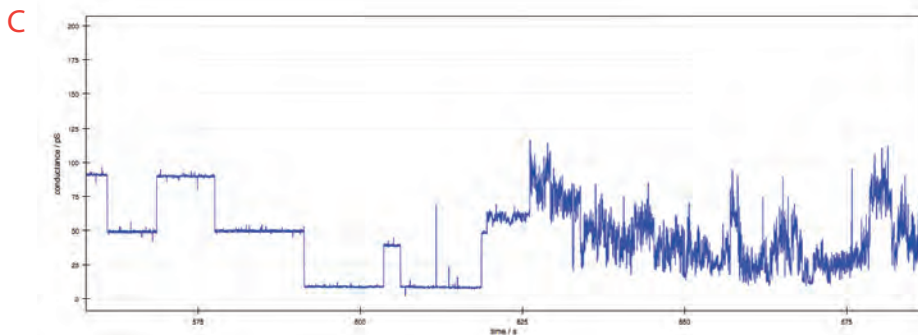
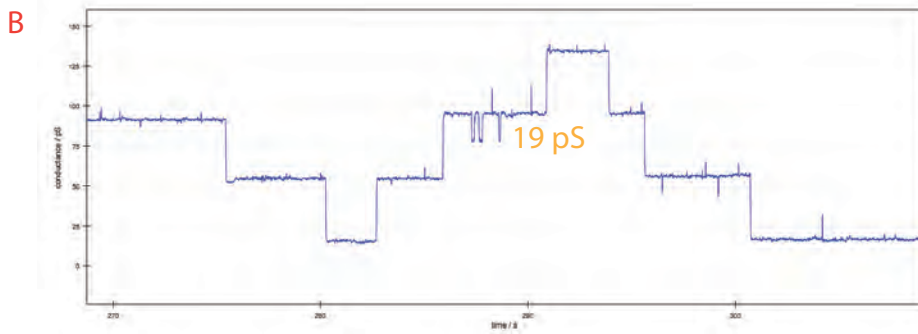


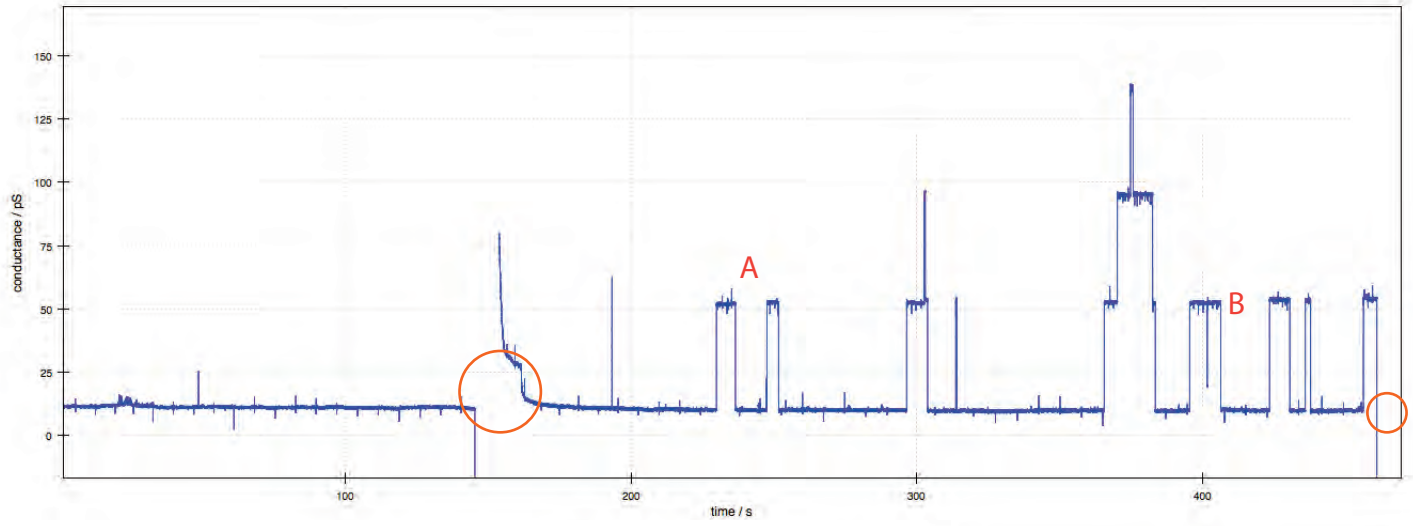
prolonged partial closure



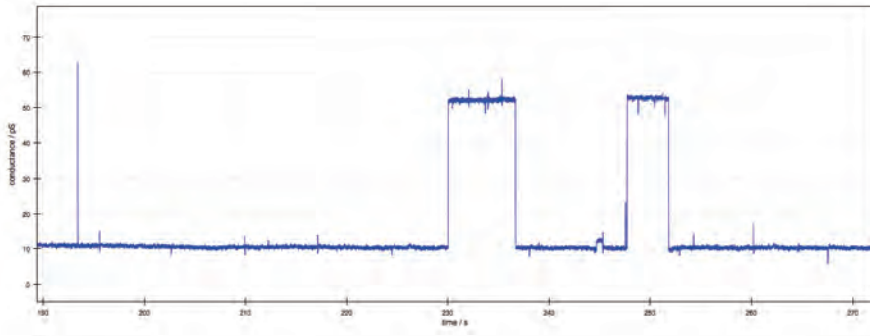


Drifting conductances
in a square top

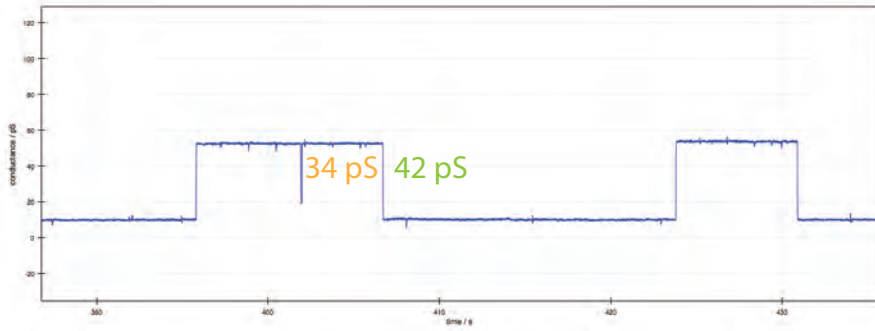


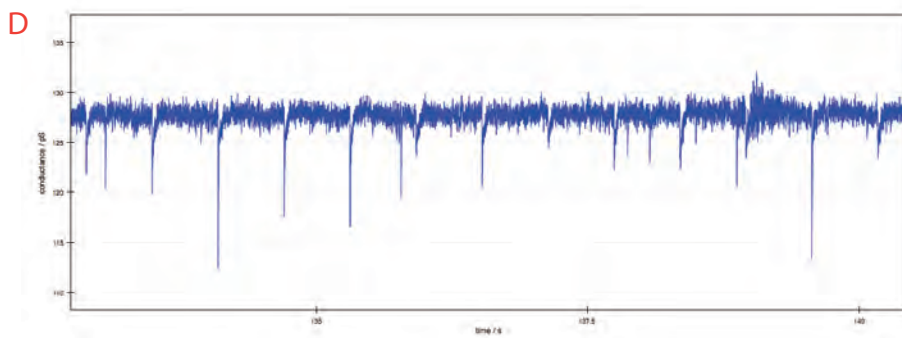
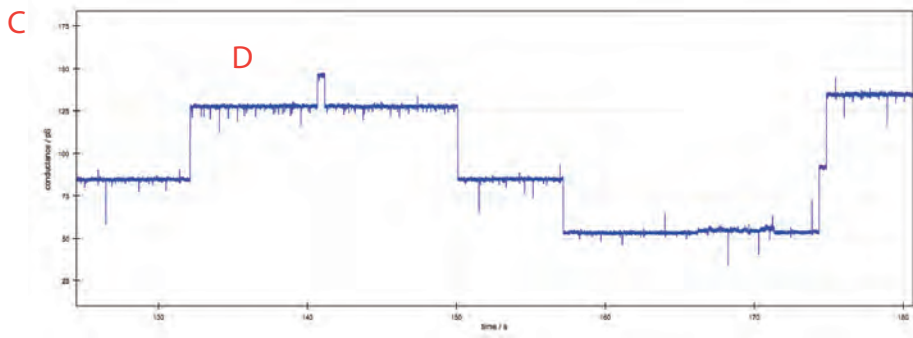
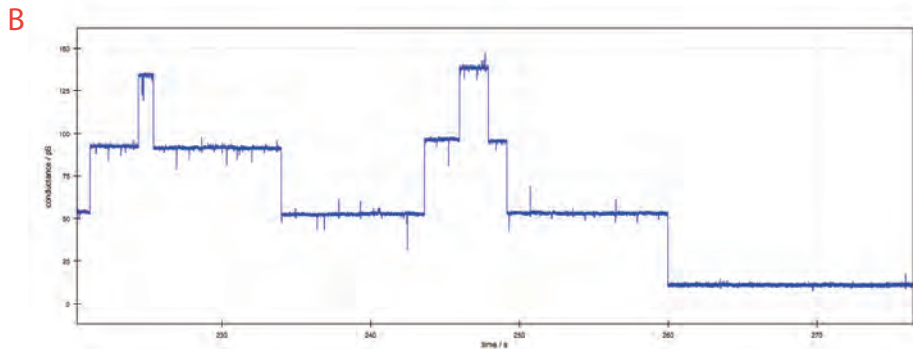
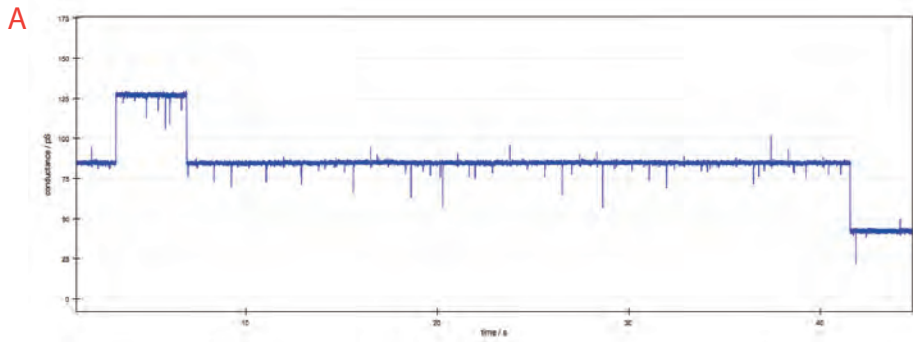
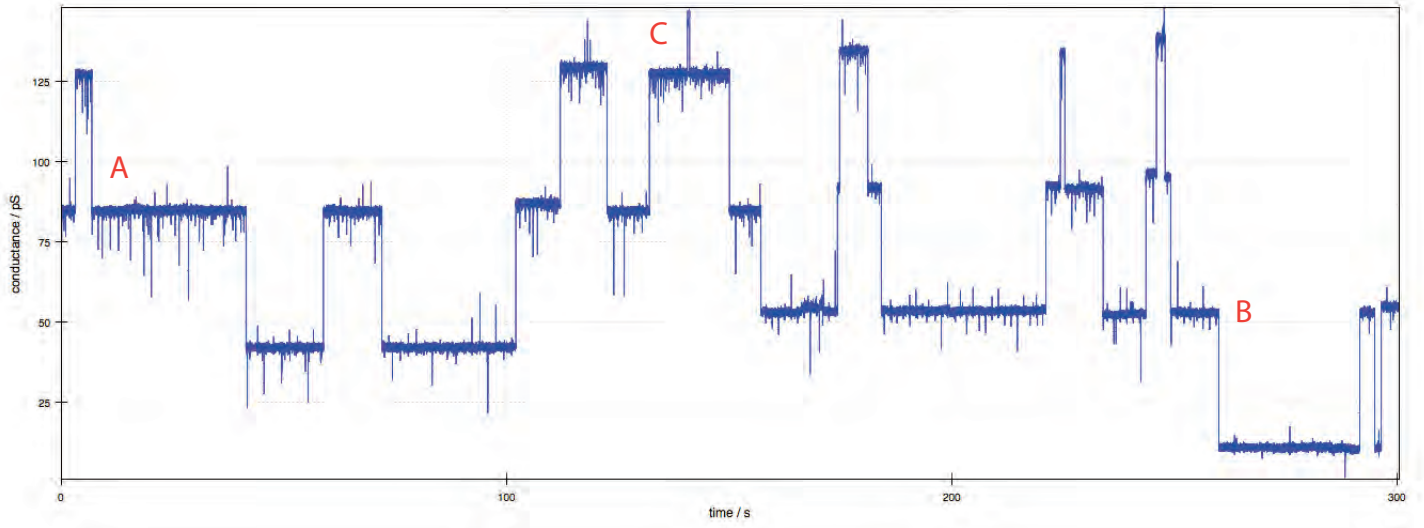


A

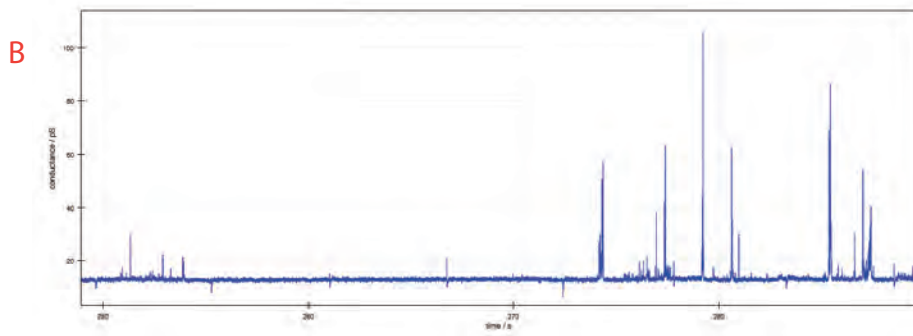
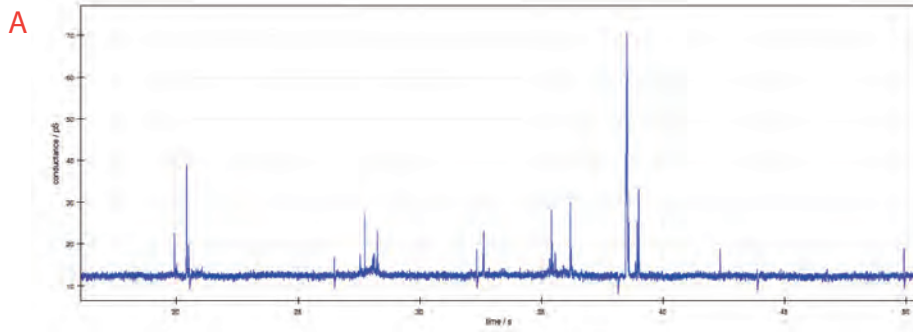
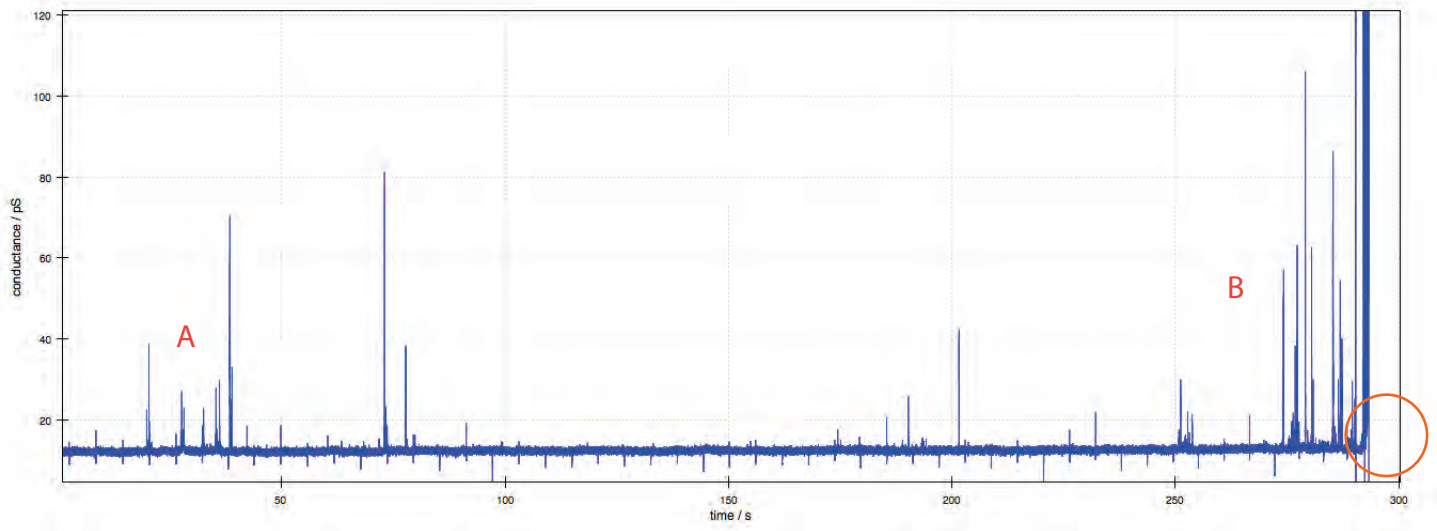


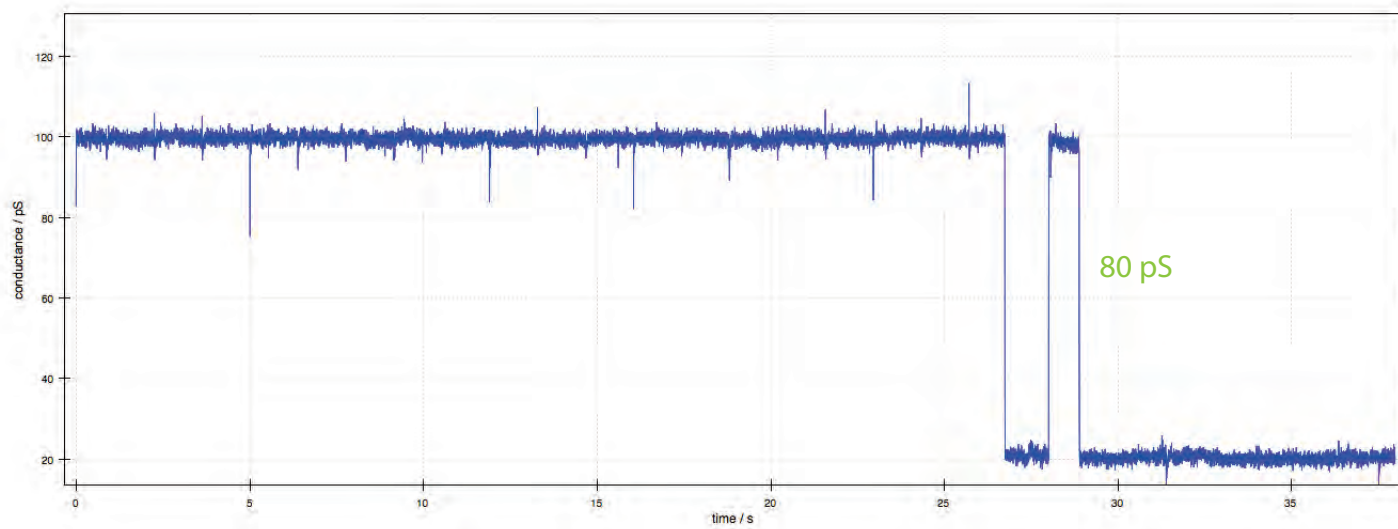
B



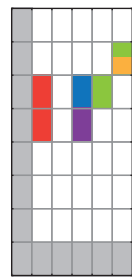
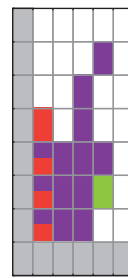
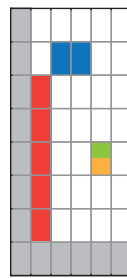
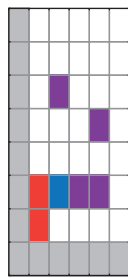
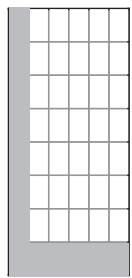
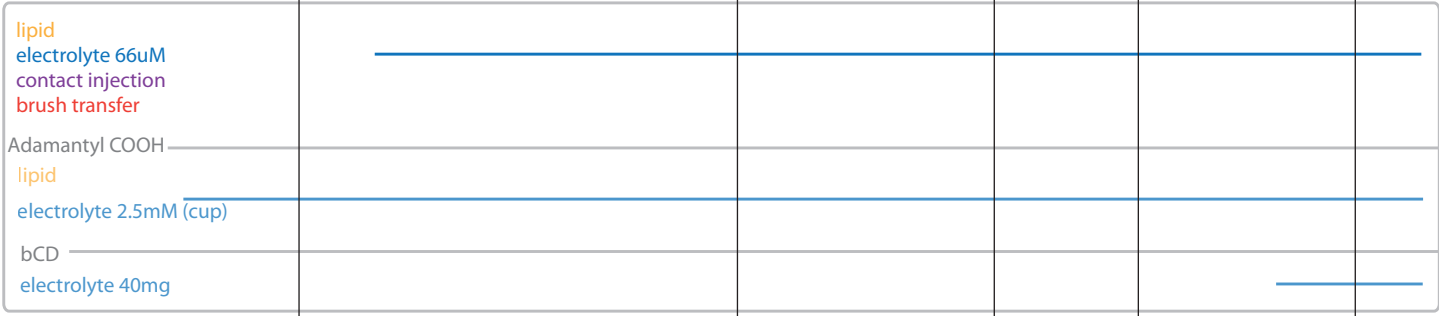
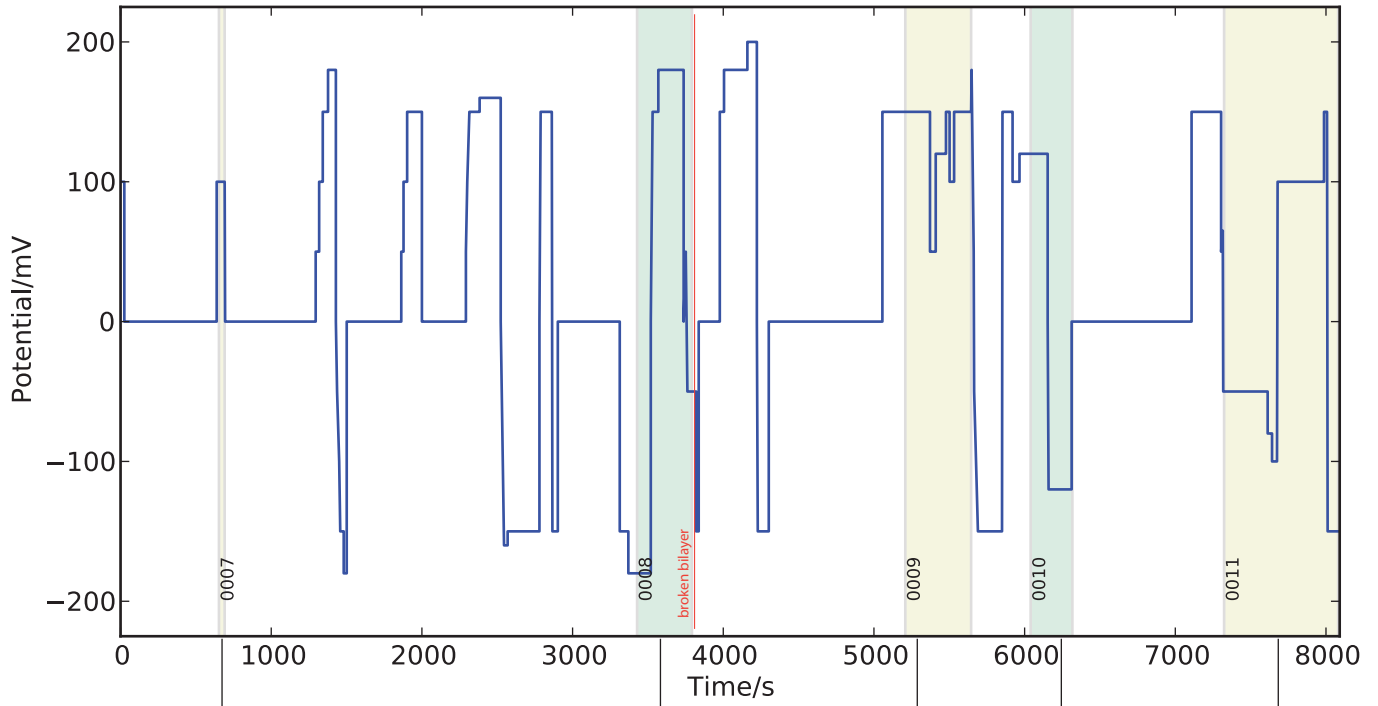


Note the absence of flicker in the true baseline; compare with expansion D



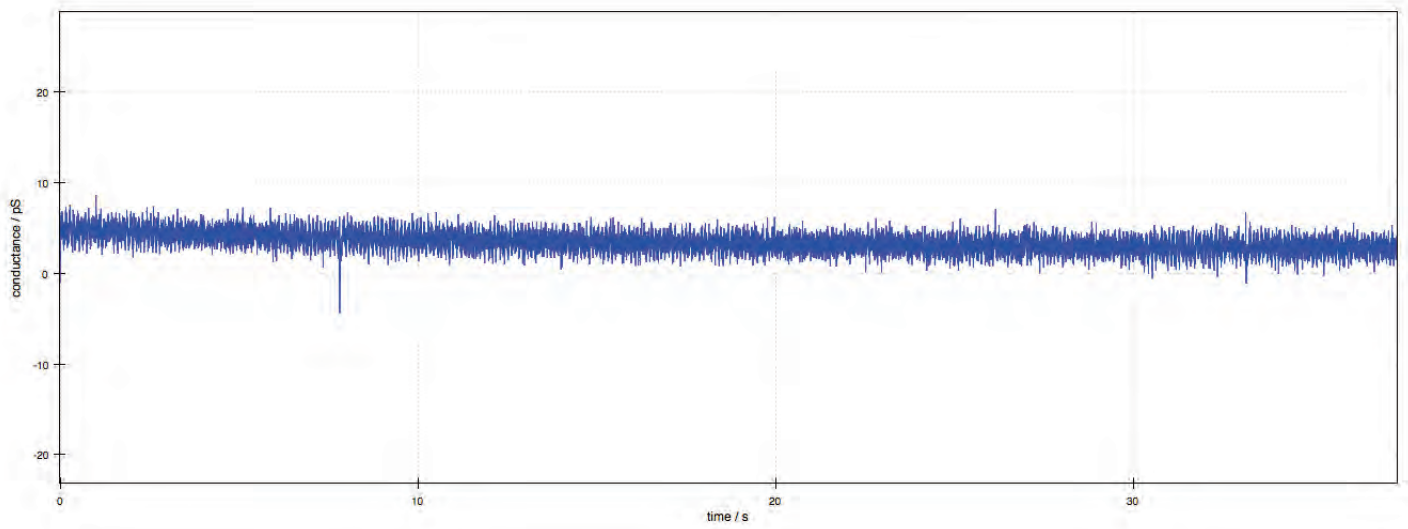


[JC-96] bCD6EsF4 1M CsCl pH 7 homoAdd (AdCOOH block)



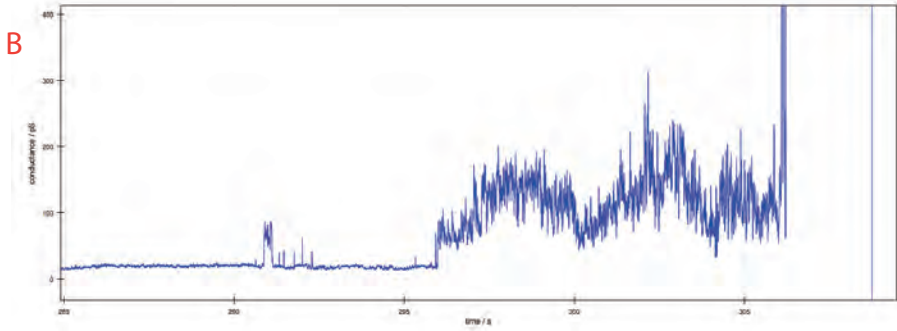
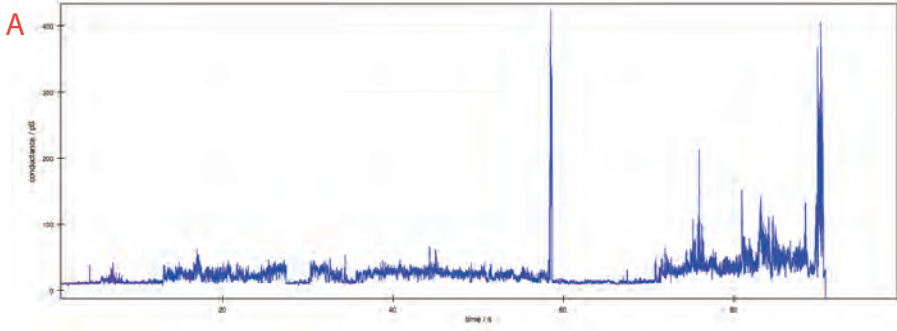
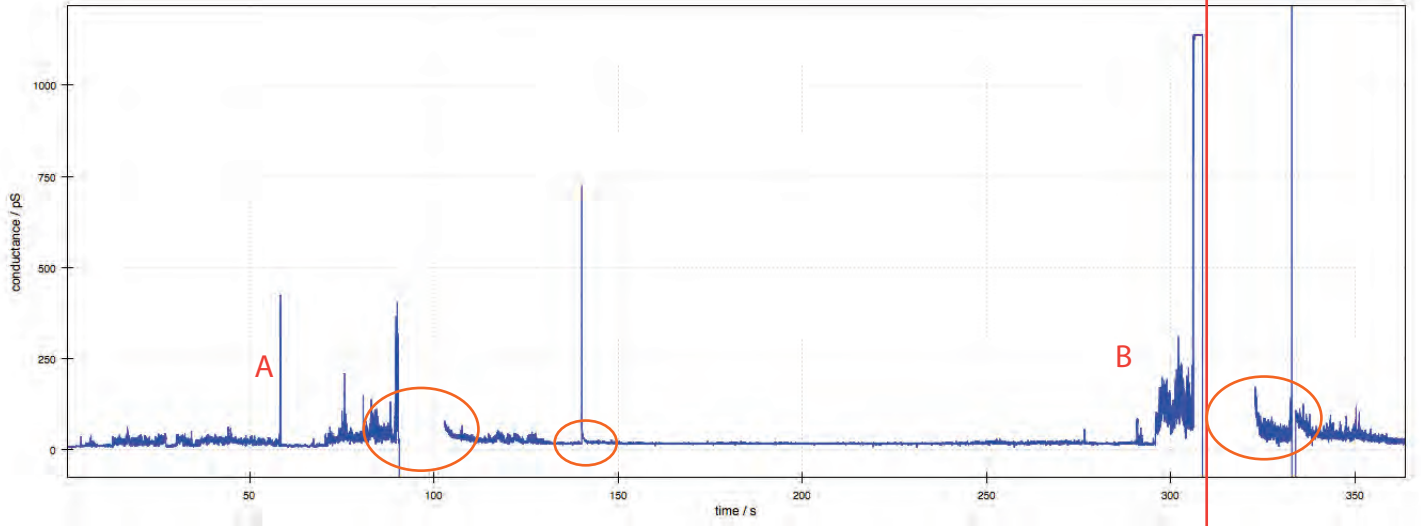
nothing with AdCOOH alone

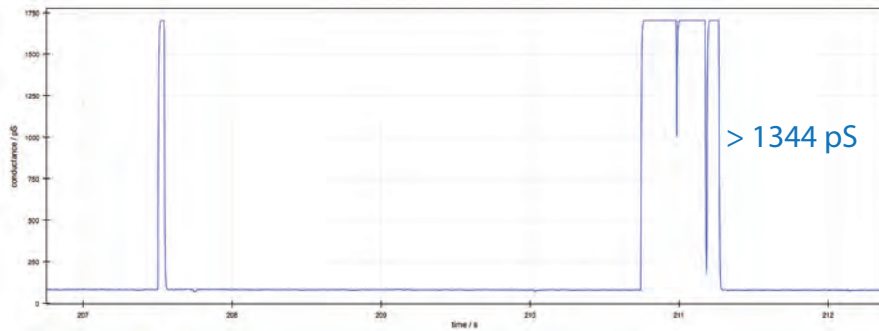
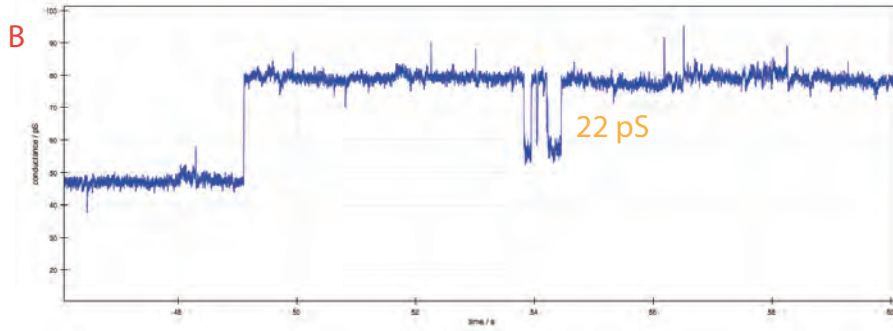
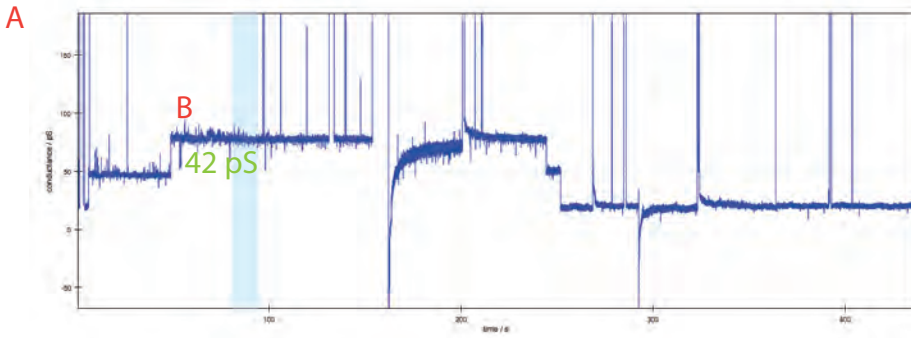
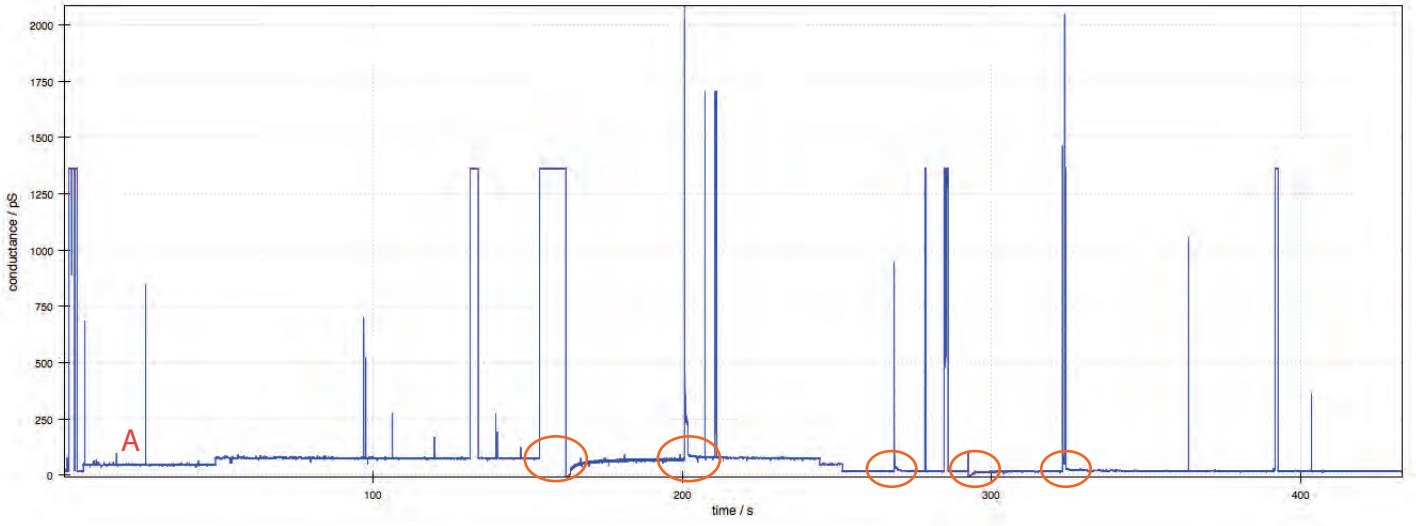
96-0007



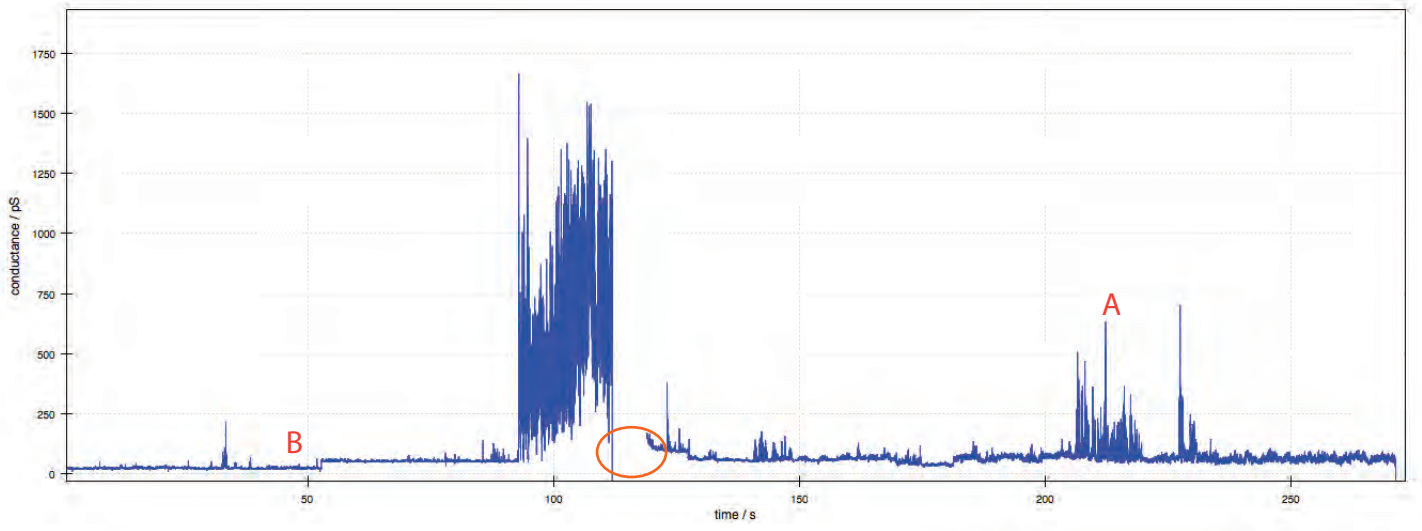
AdCOOH on its own does not induce leakage

96-0008

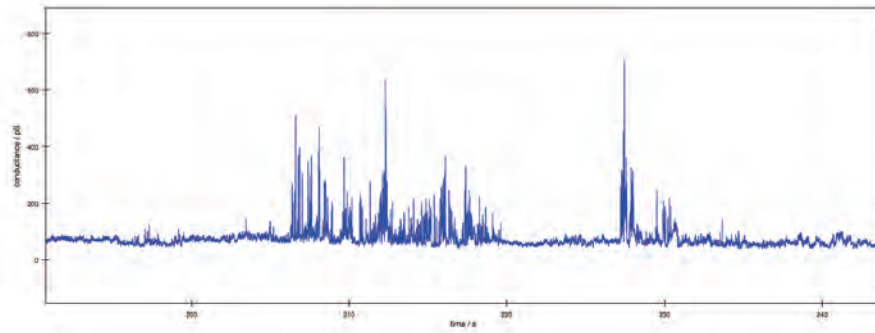




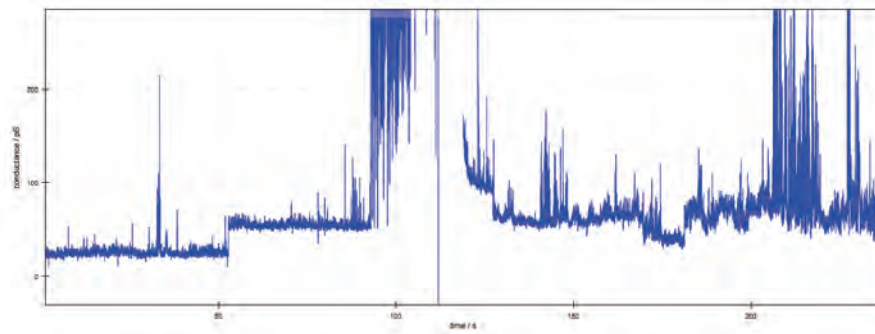
all responses clipped

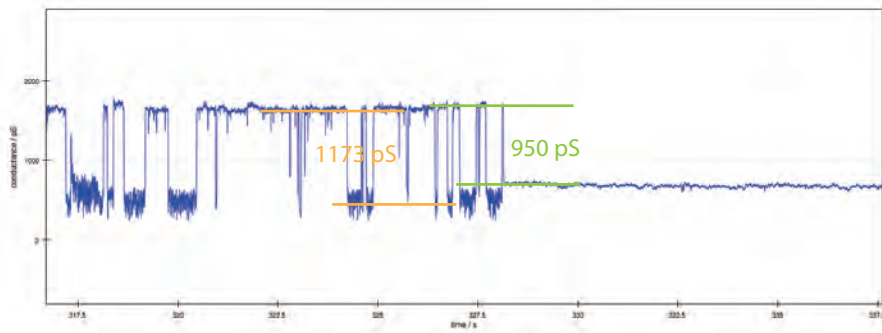
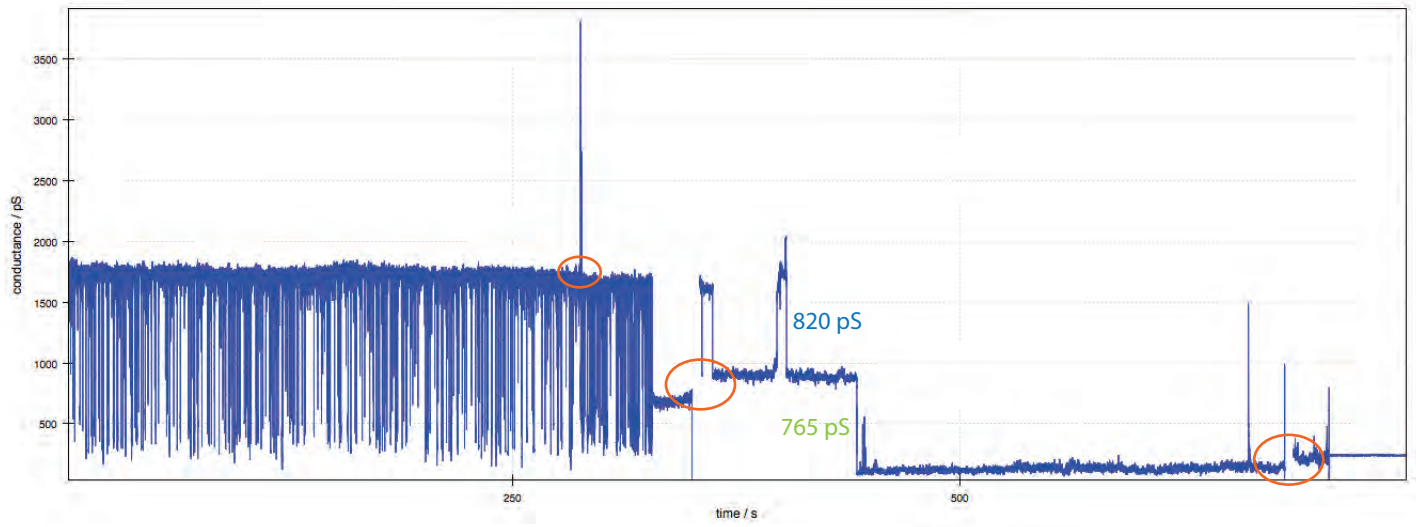


A

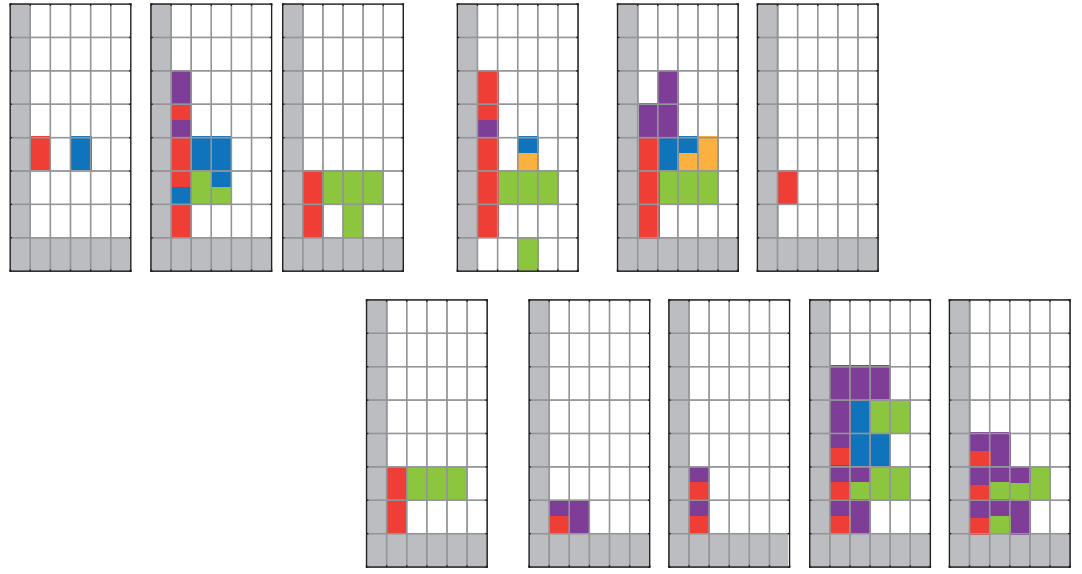
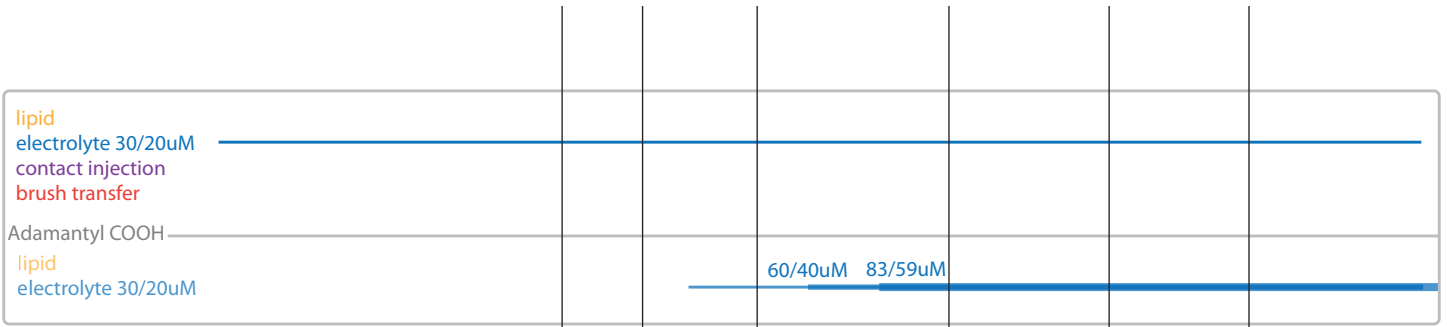
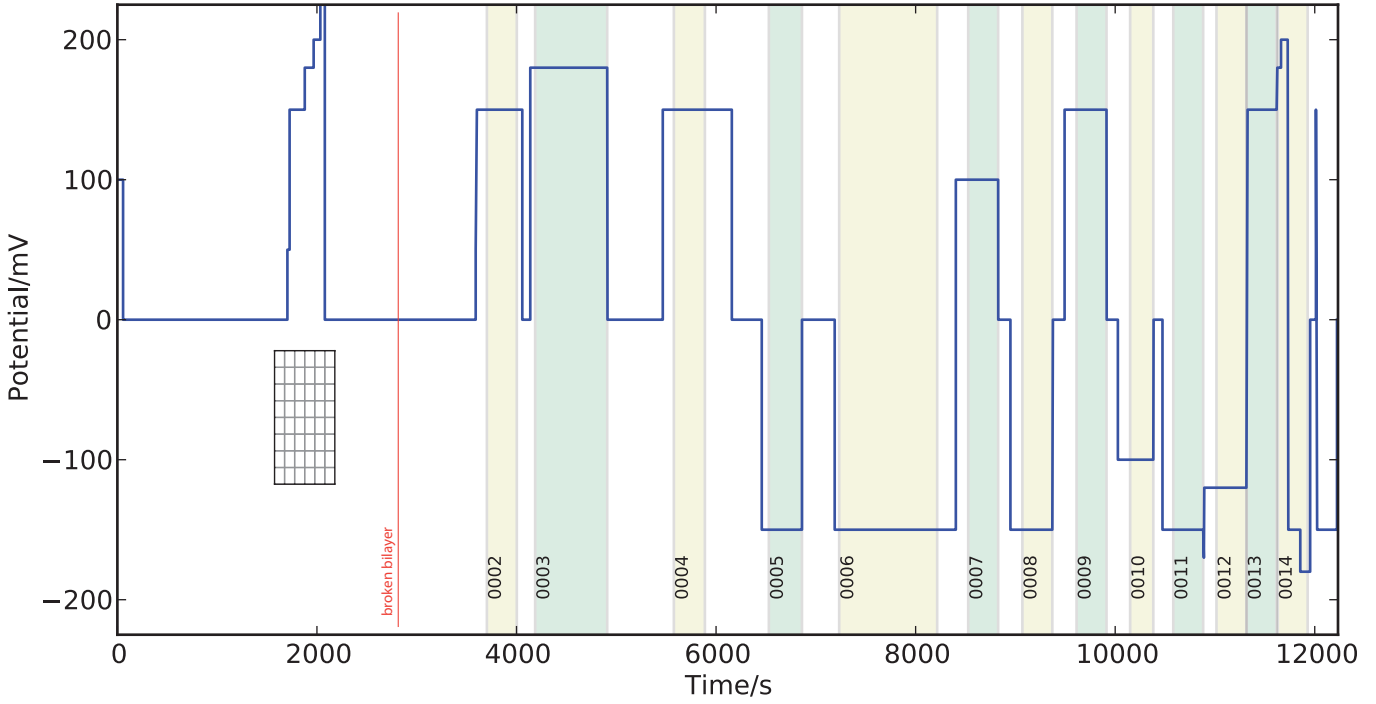


B

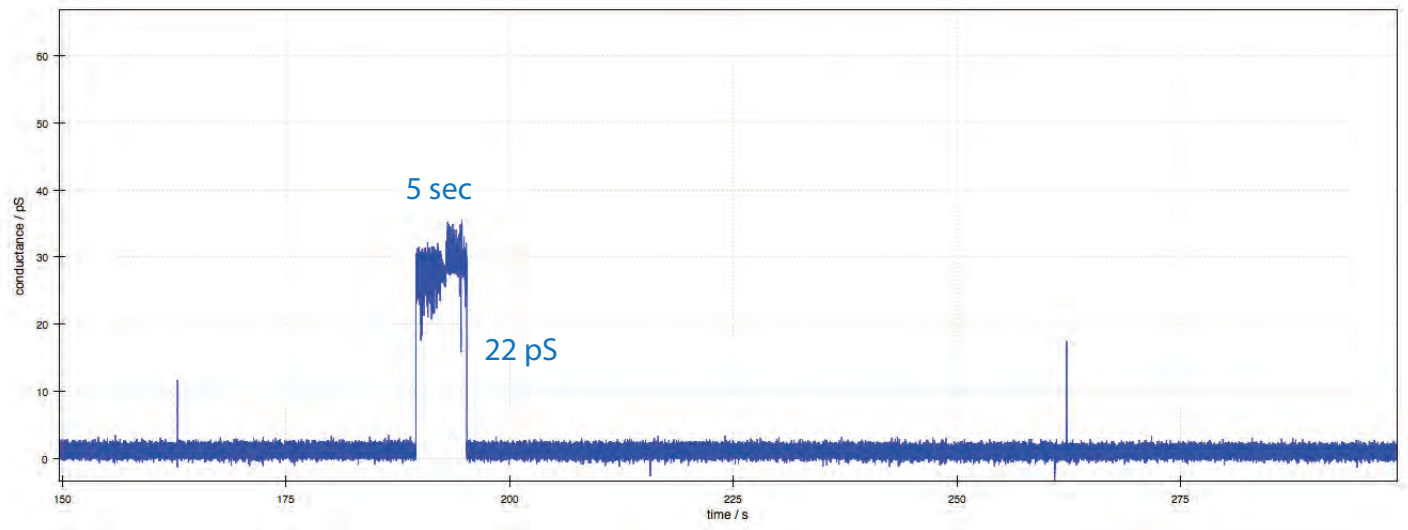


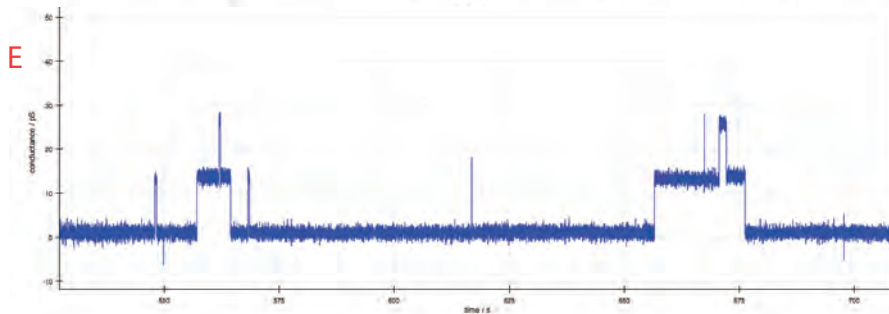
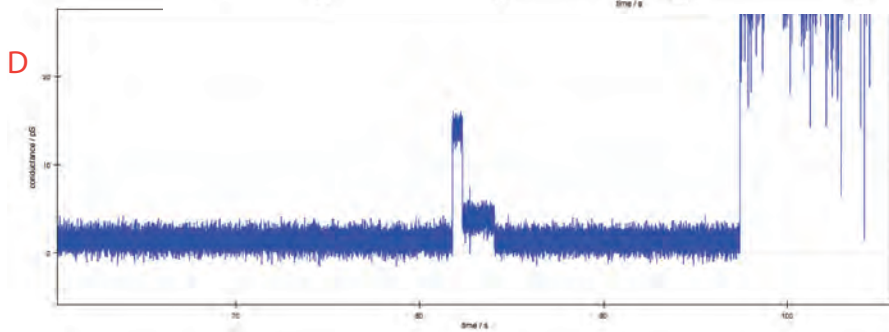
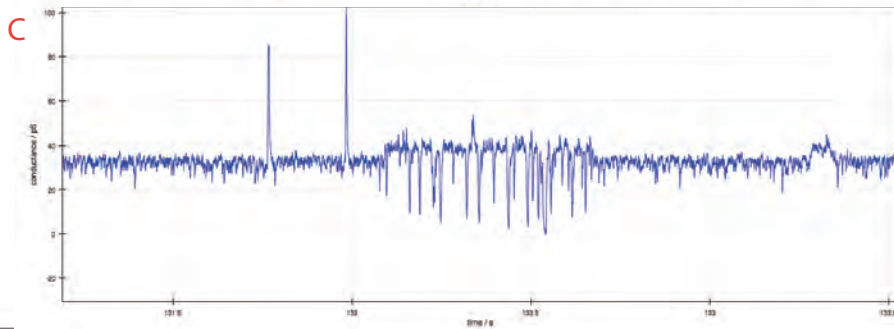
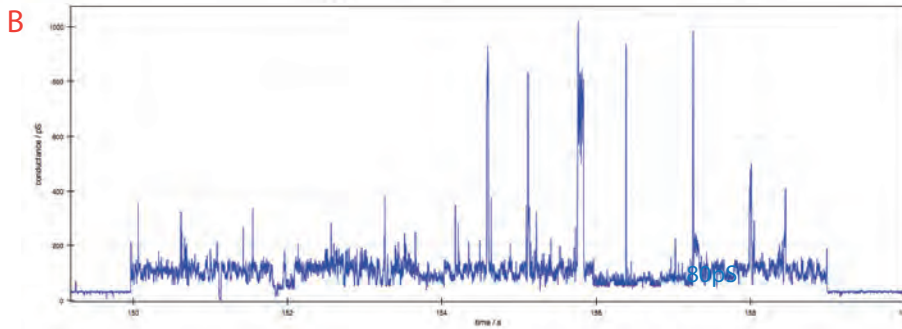
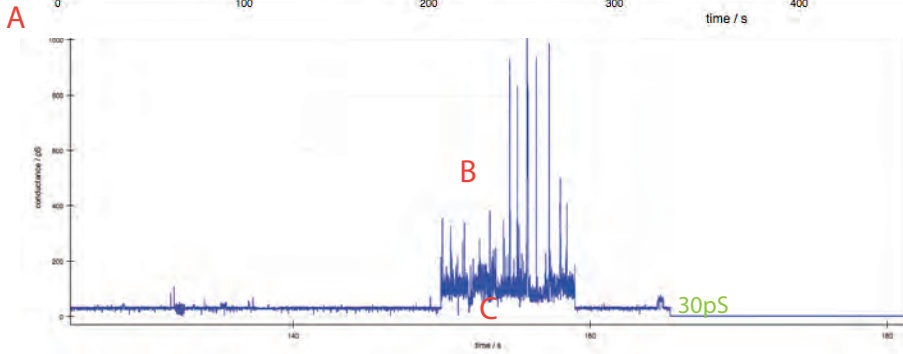
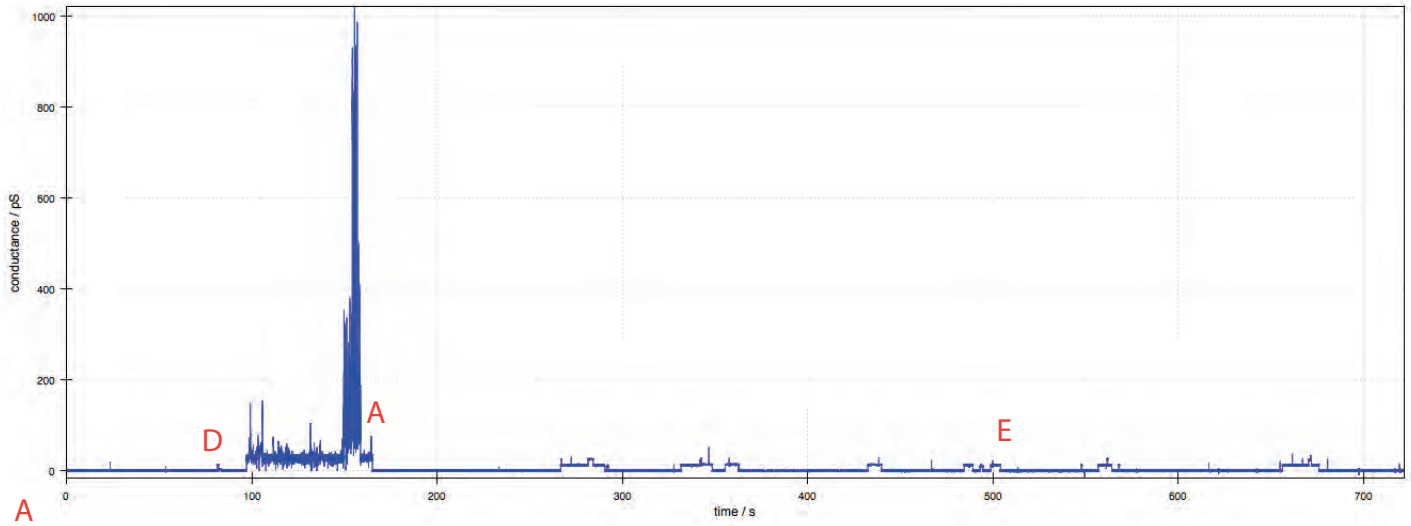


[JC-97] bCD6EsF4 1M NaCl pH 7 homoAdd

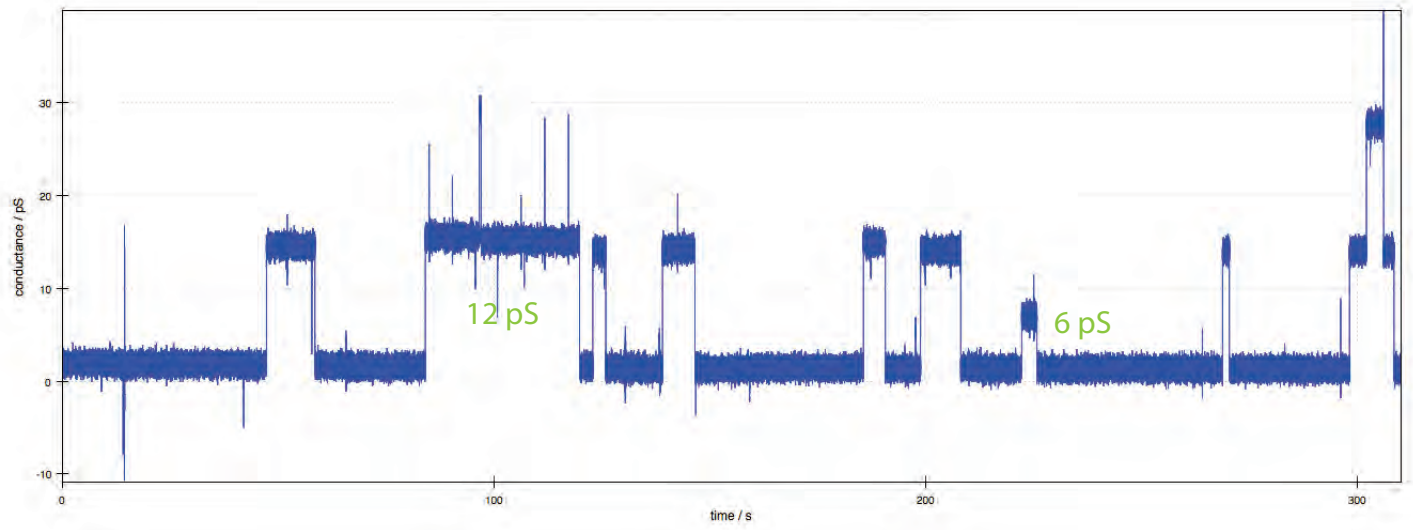


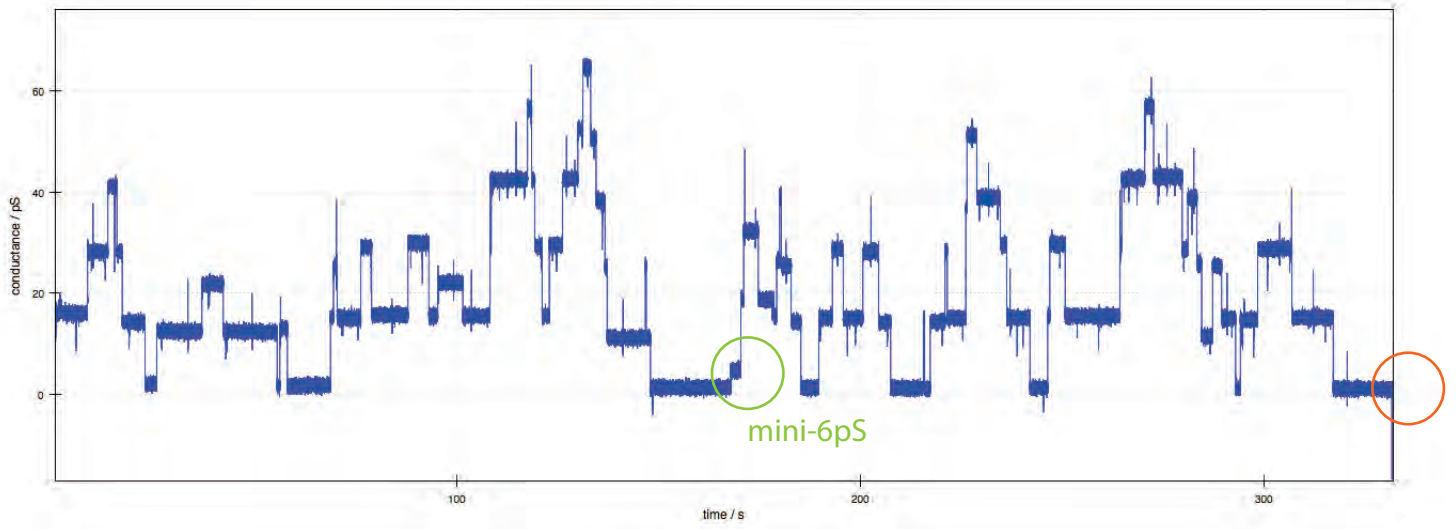
97-0002

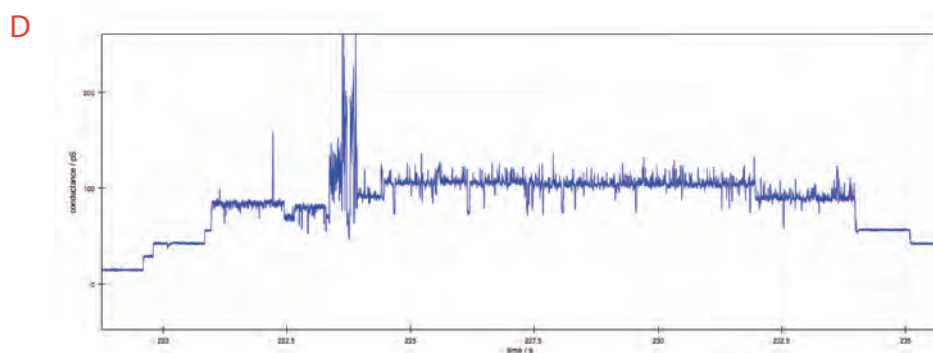
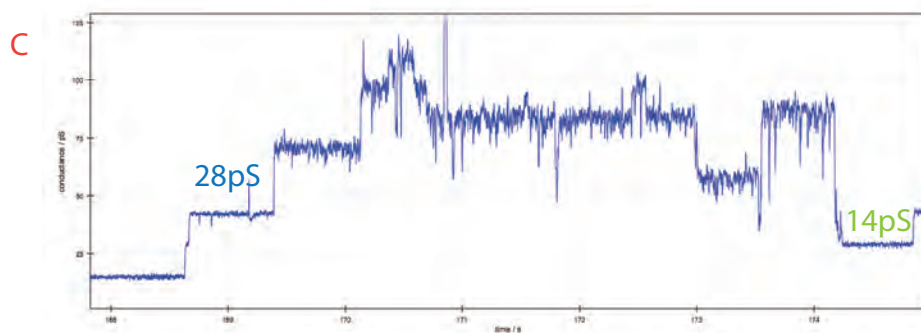
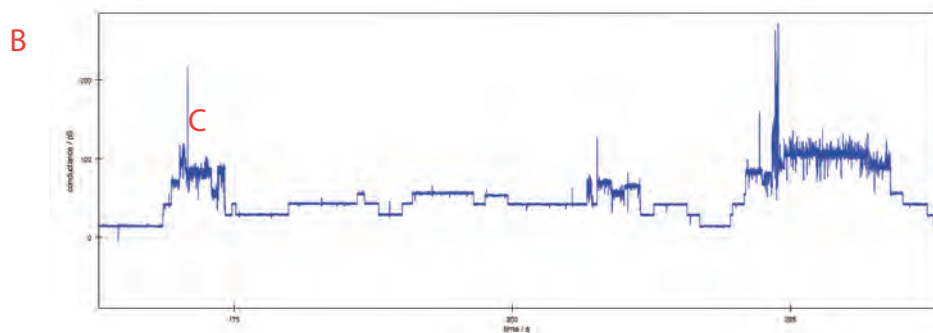
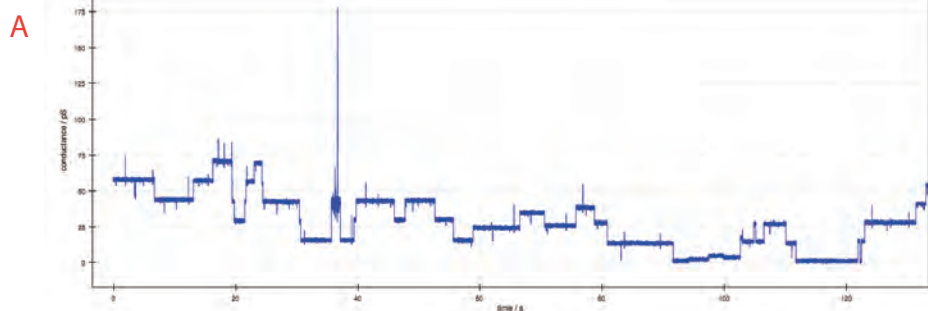
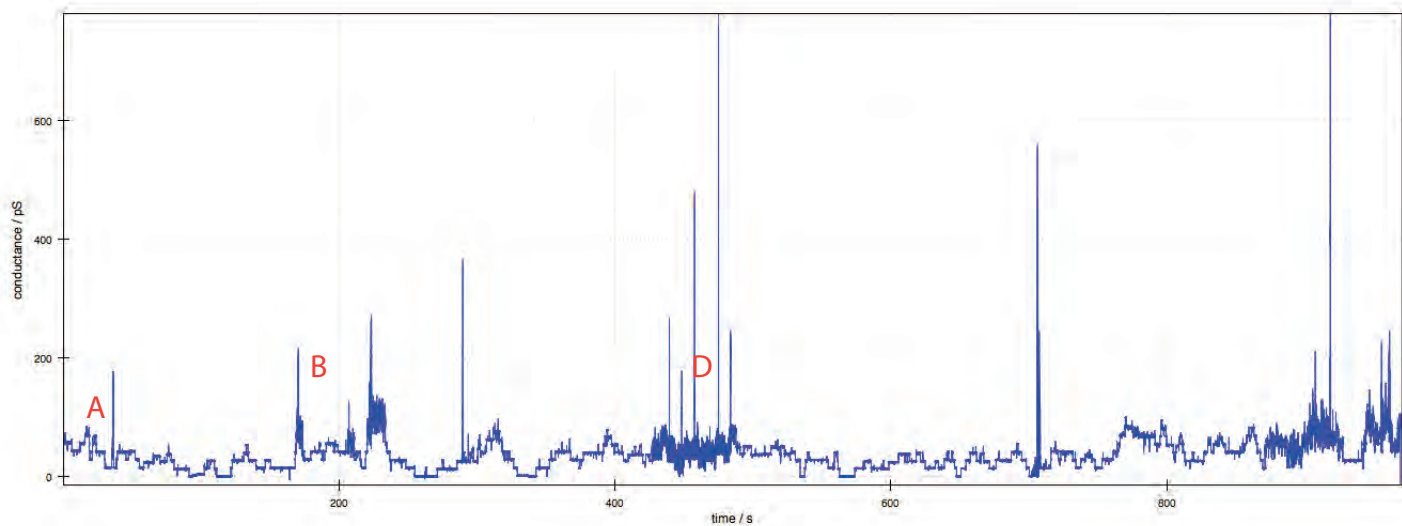


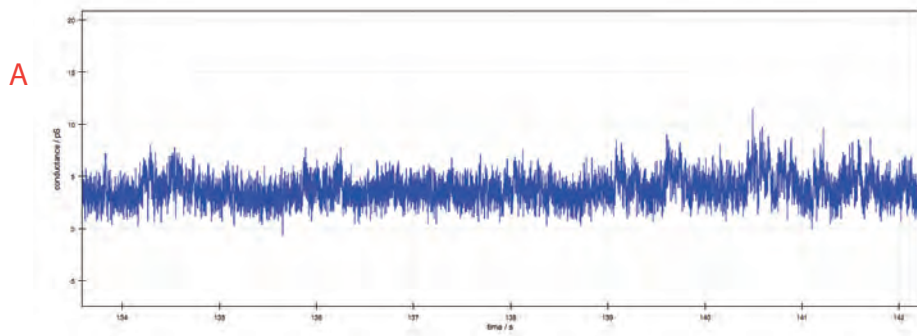
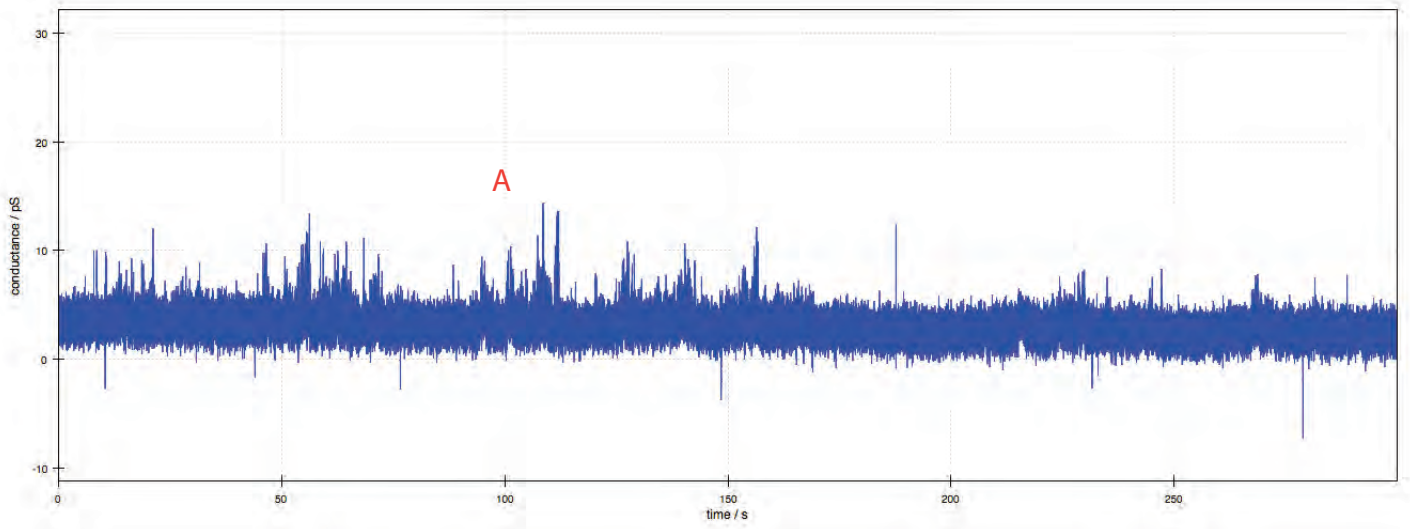


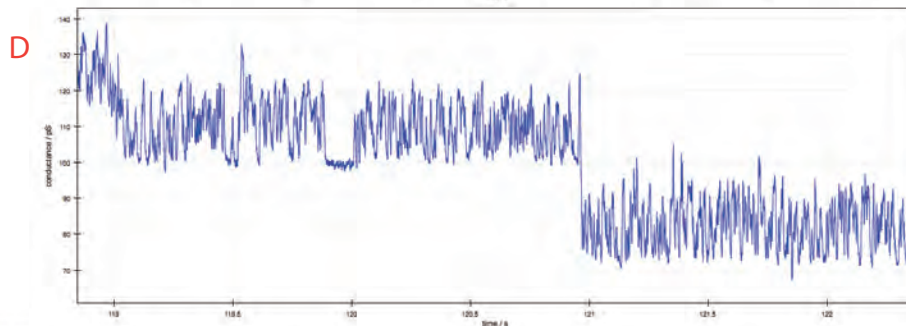
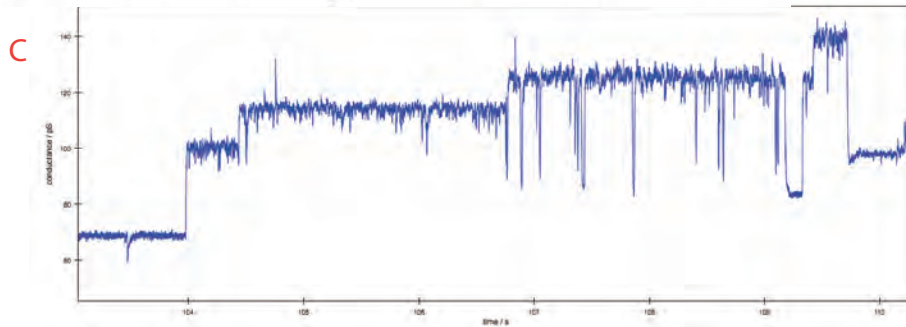
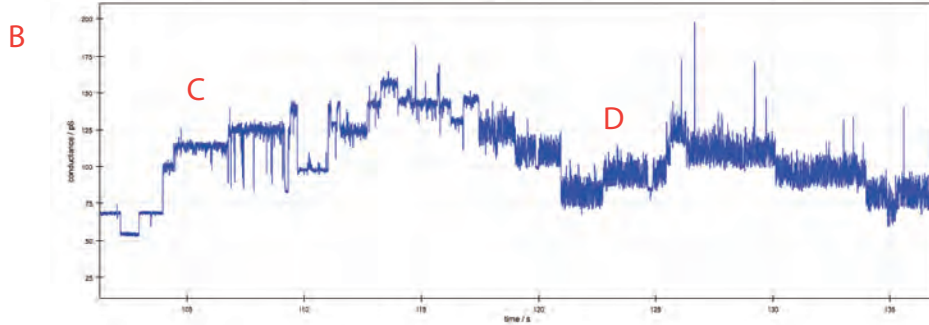
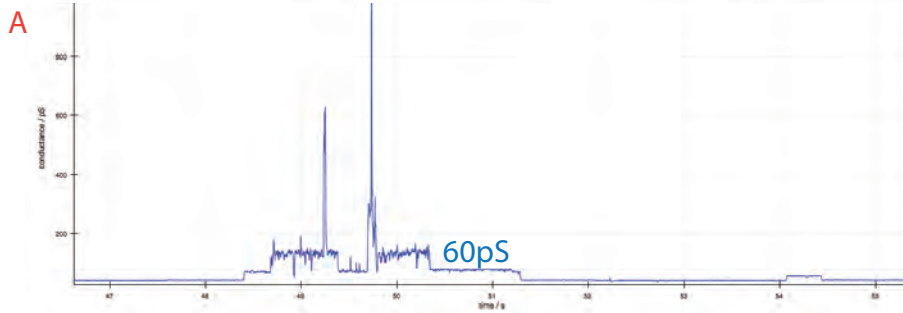
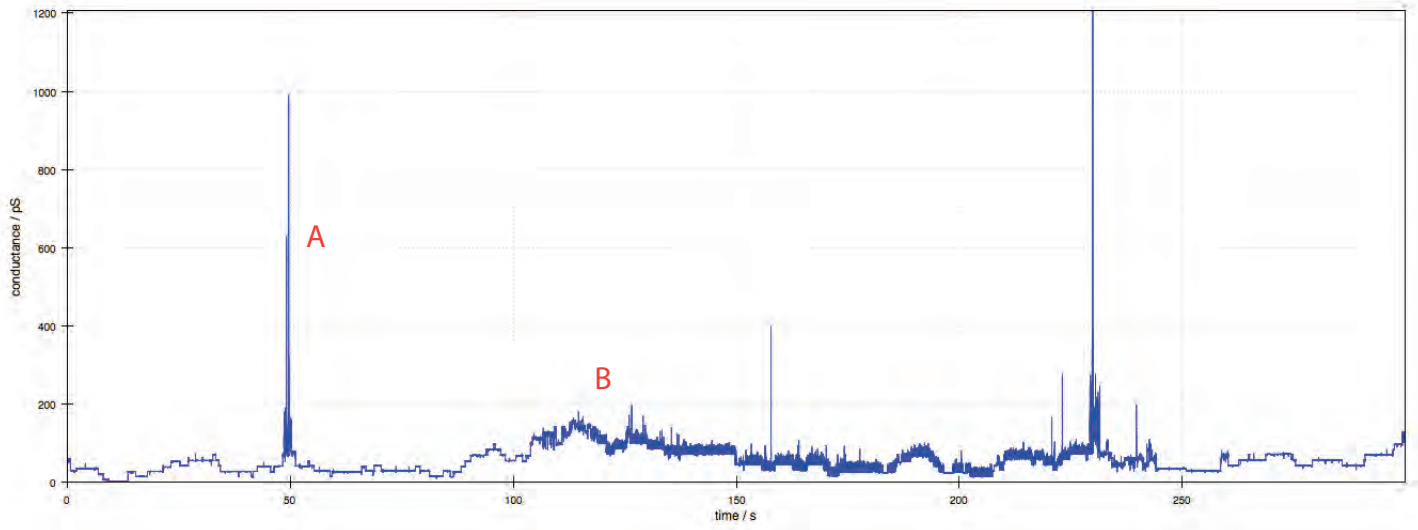
97-0004



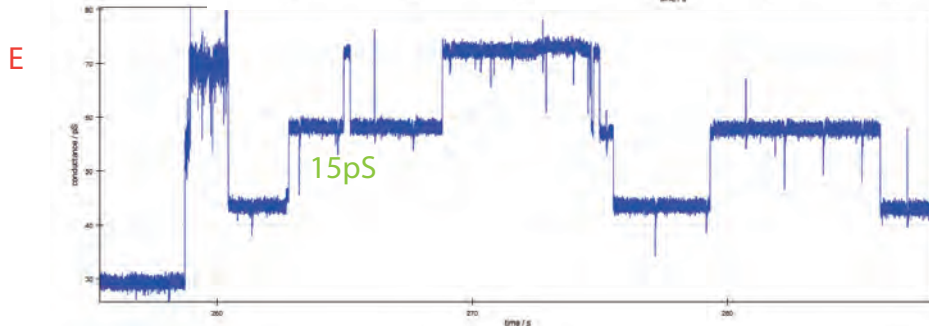




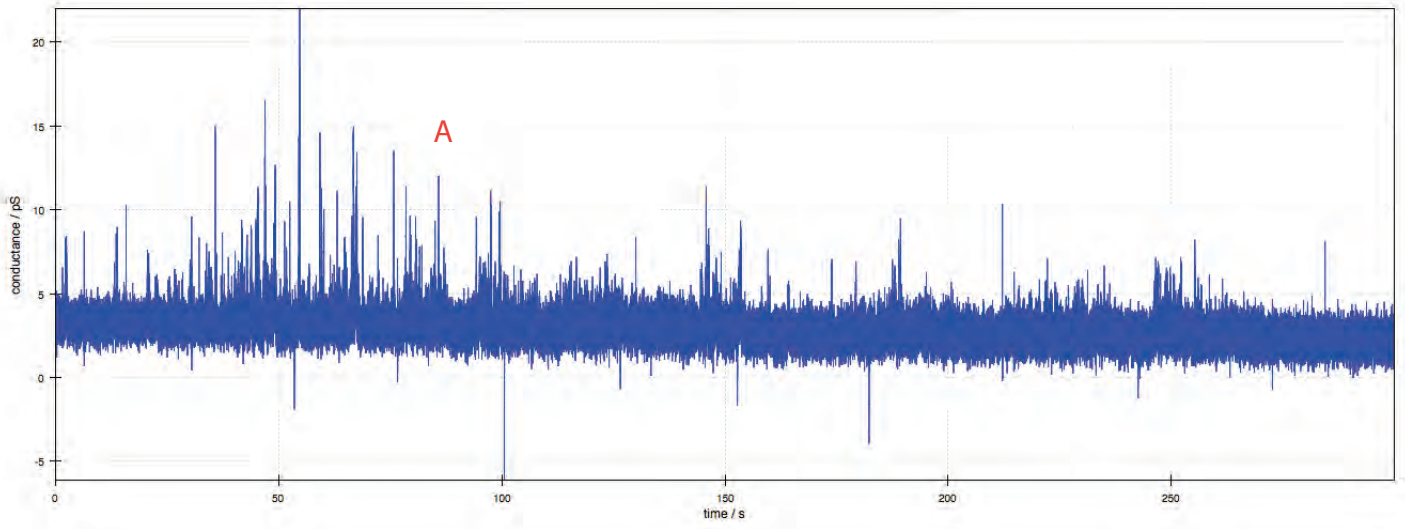




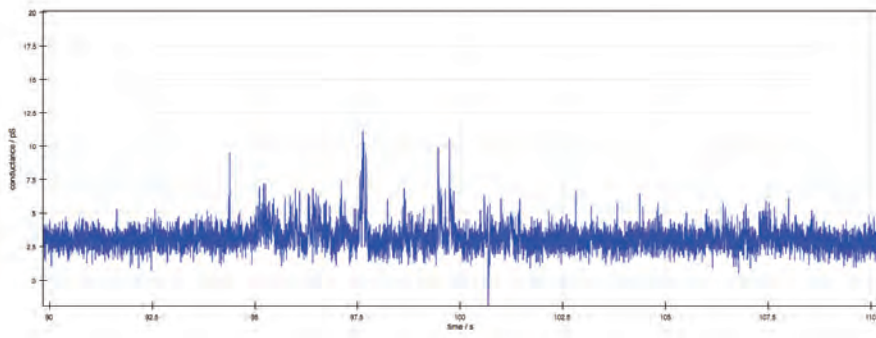
long-living regular flicker (small)



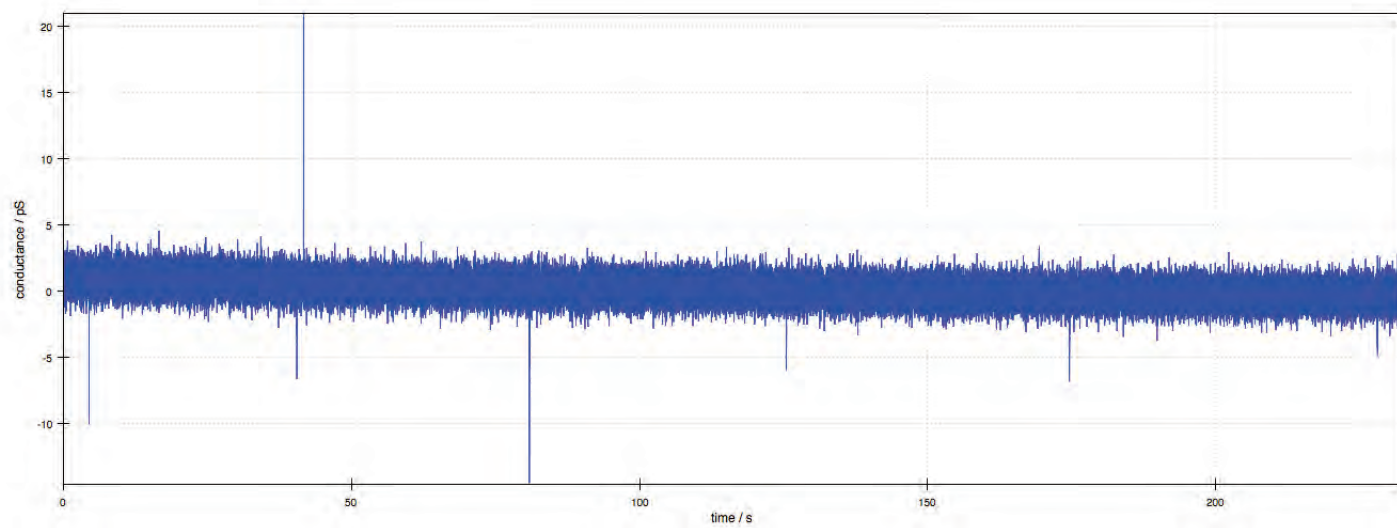
97-0009

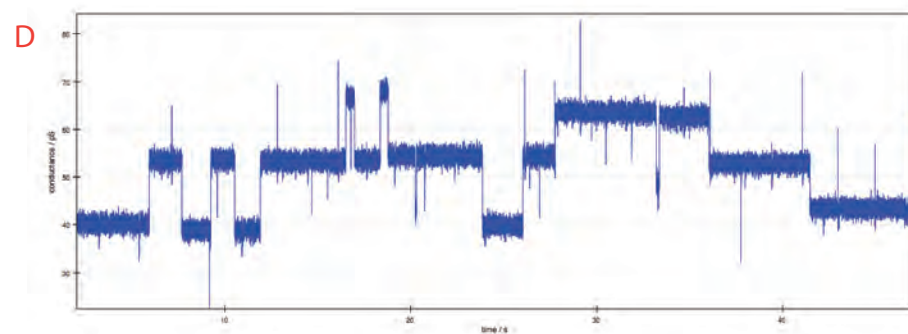
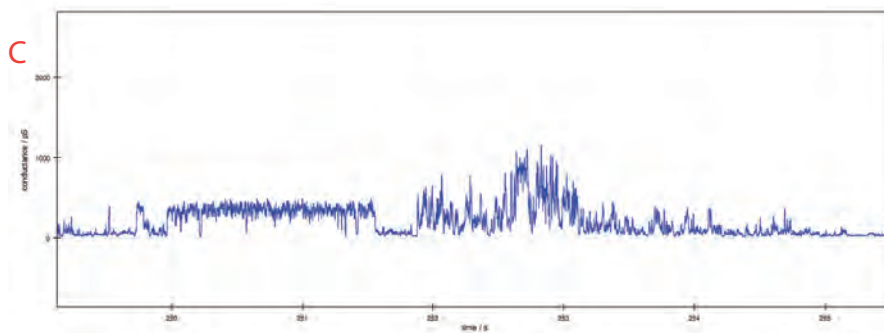
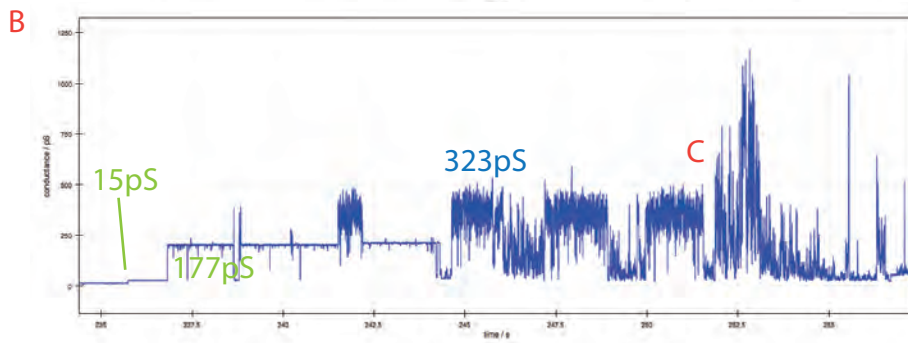
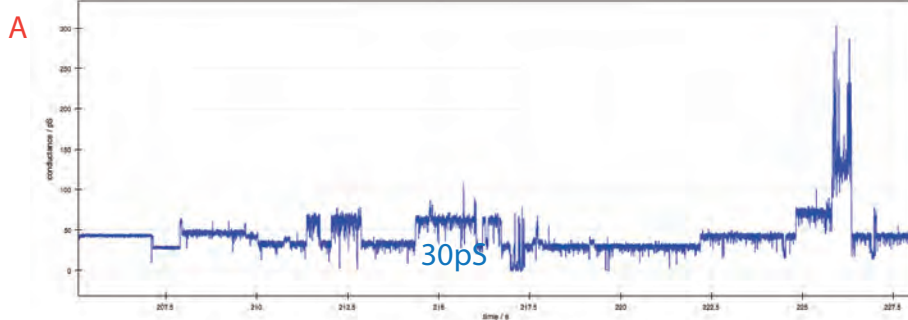
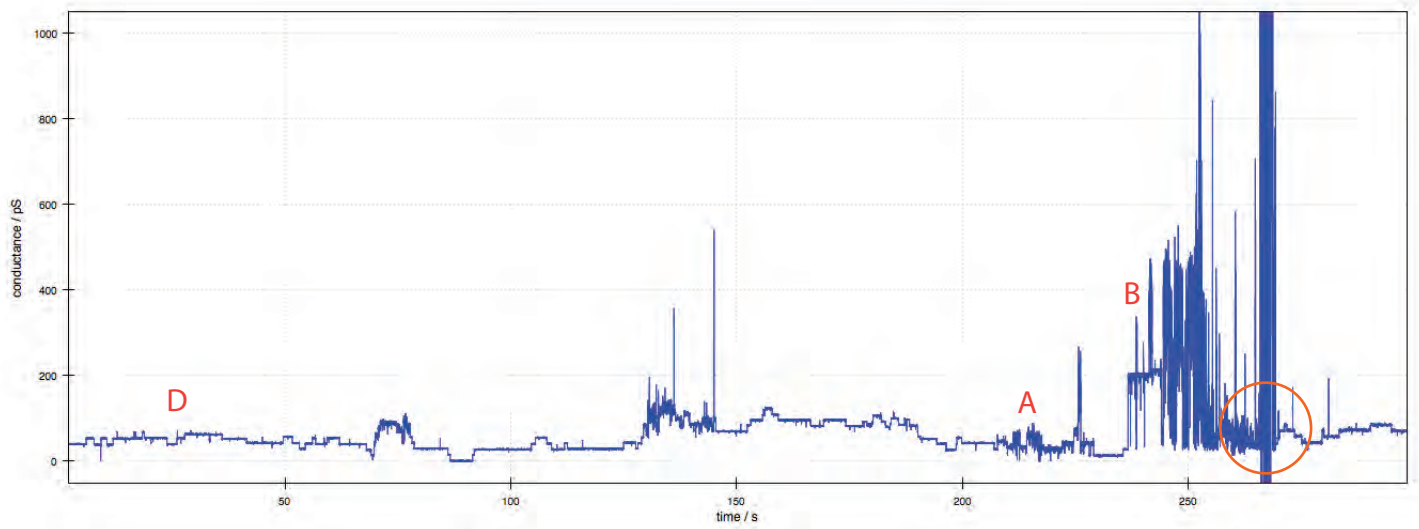


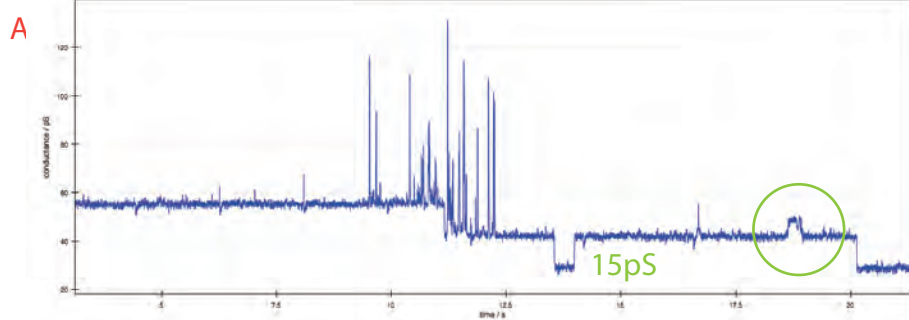
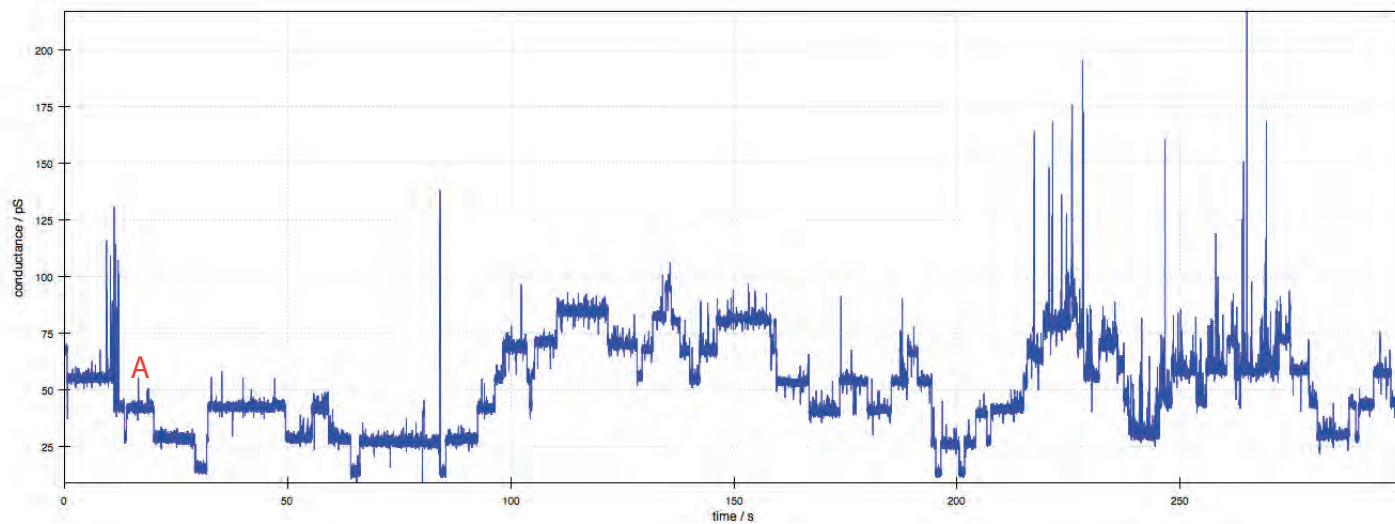
A

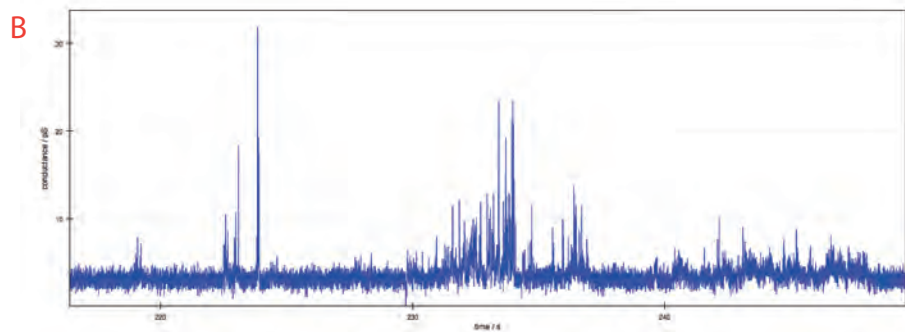
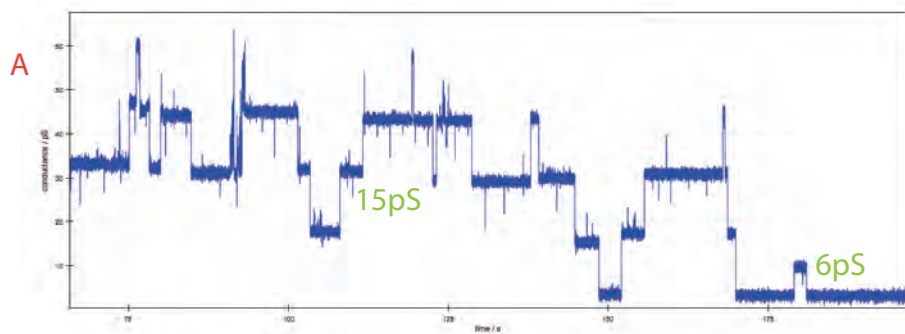
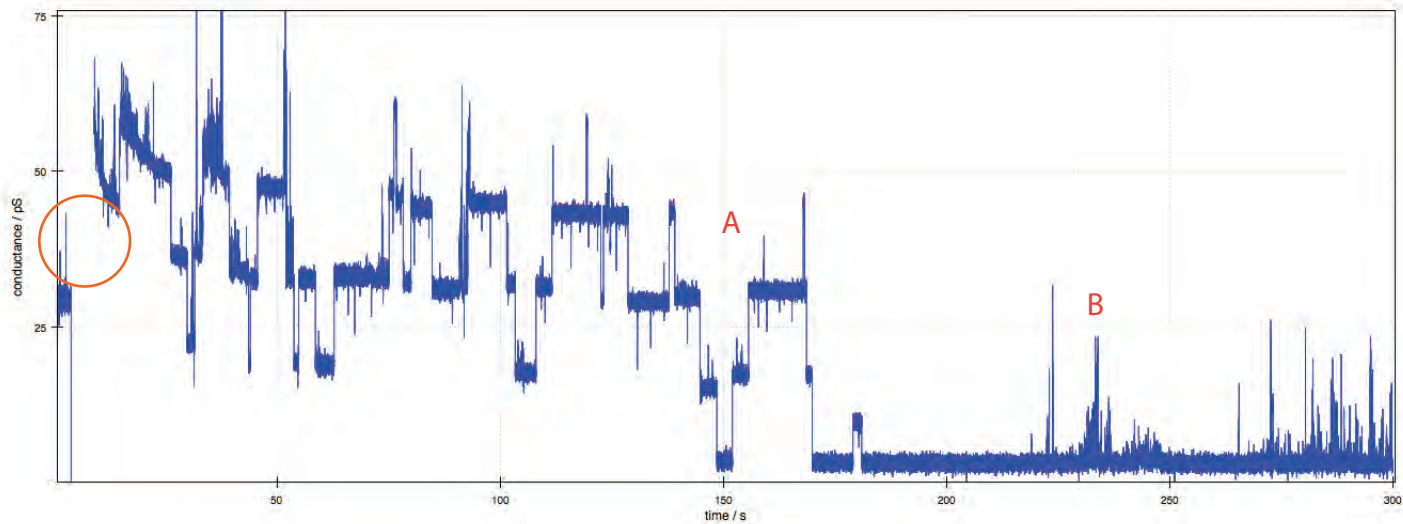


97-0010

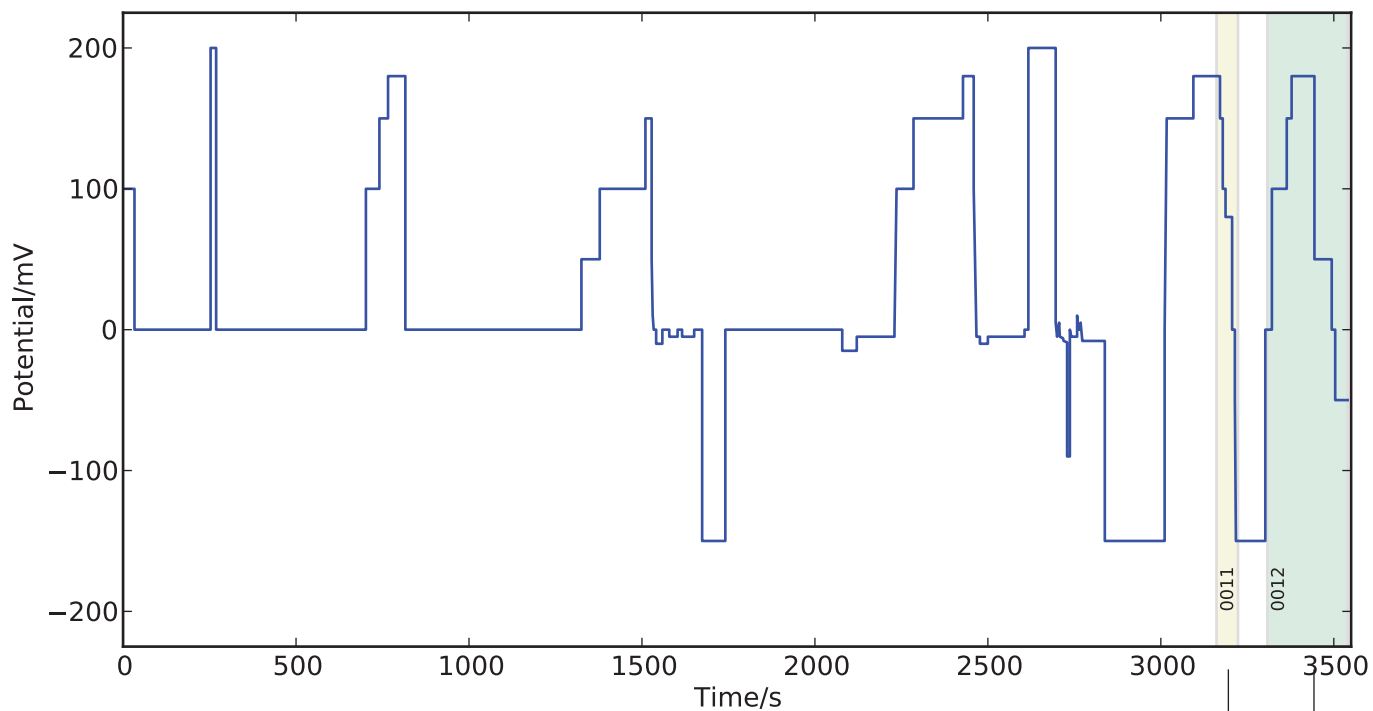




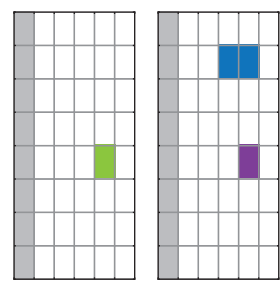


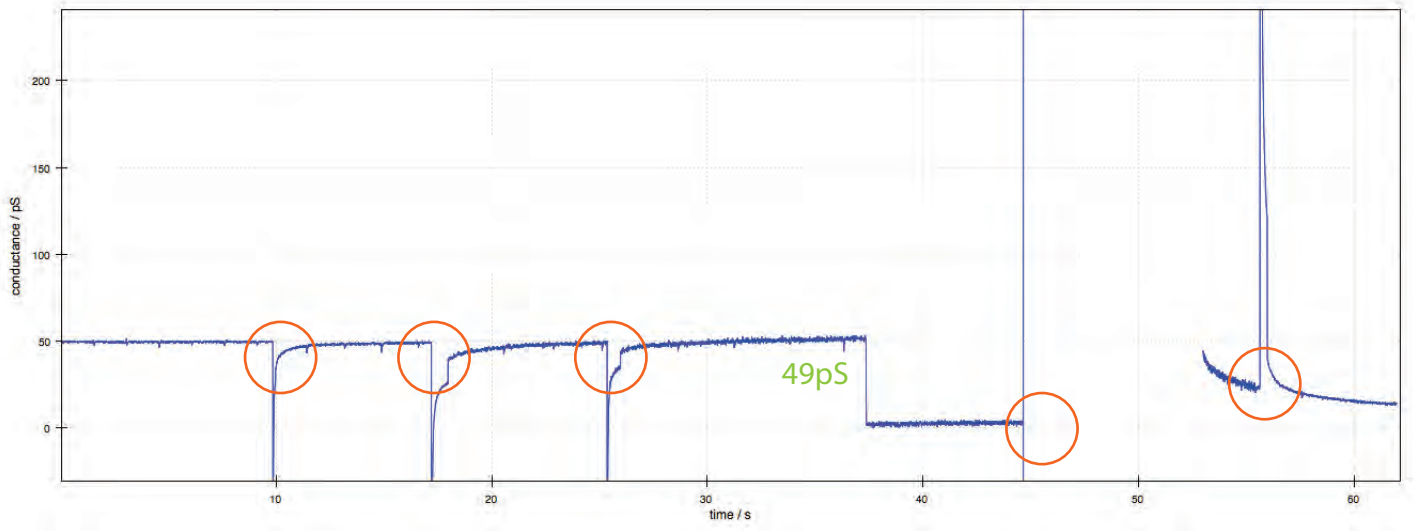


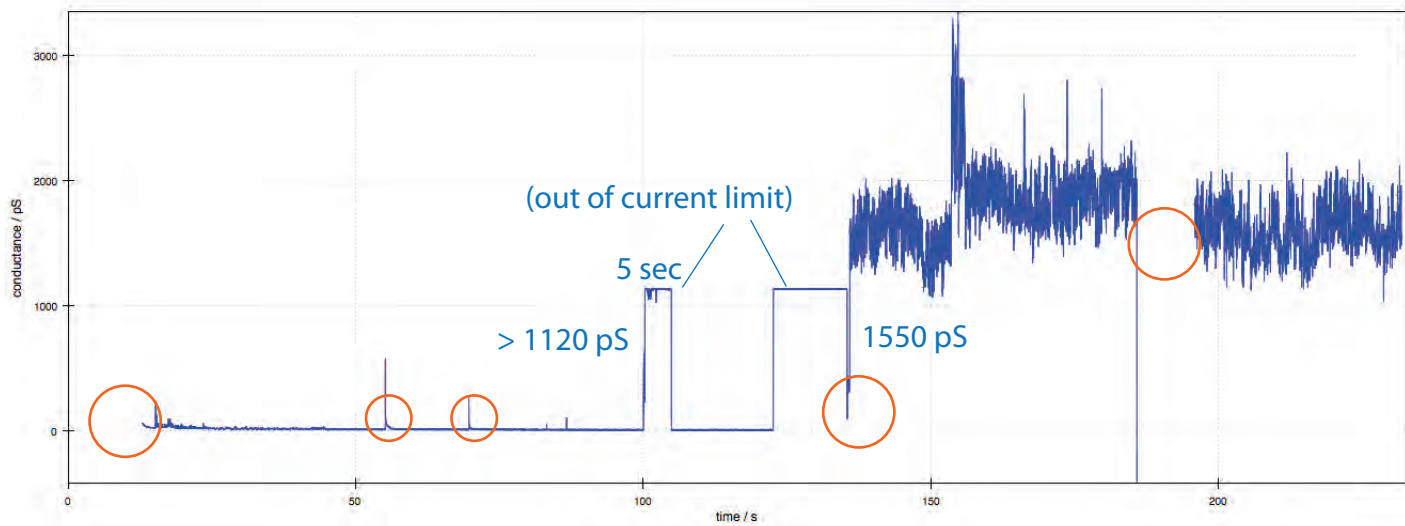
asymmetric electrolyte!
[JC-100] bCD6EsF4 200mM 1M CsCl pH 7



lipid
electrolyte
contact injection 66uM
brush transfer

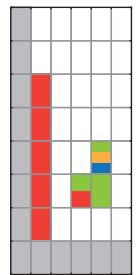
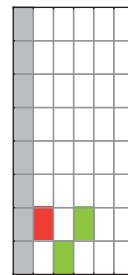
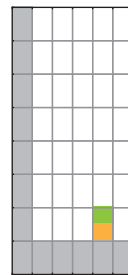
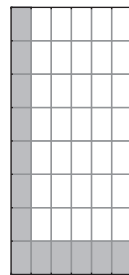
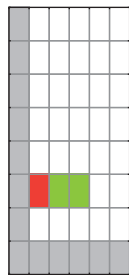
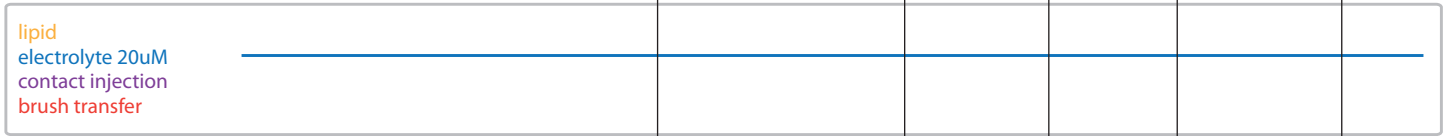
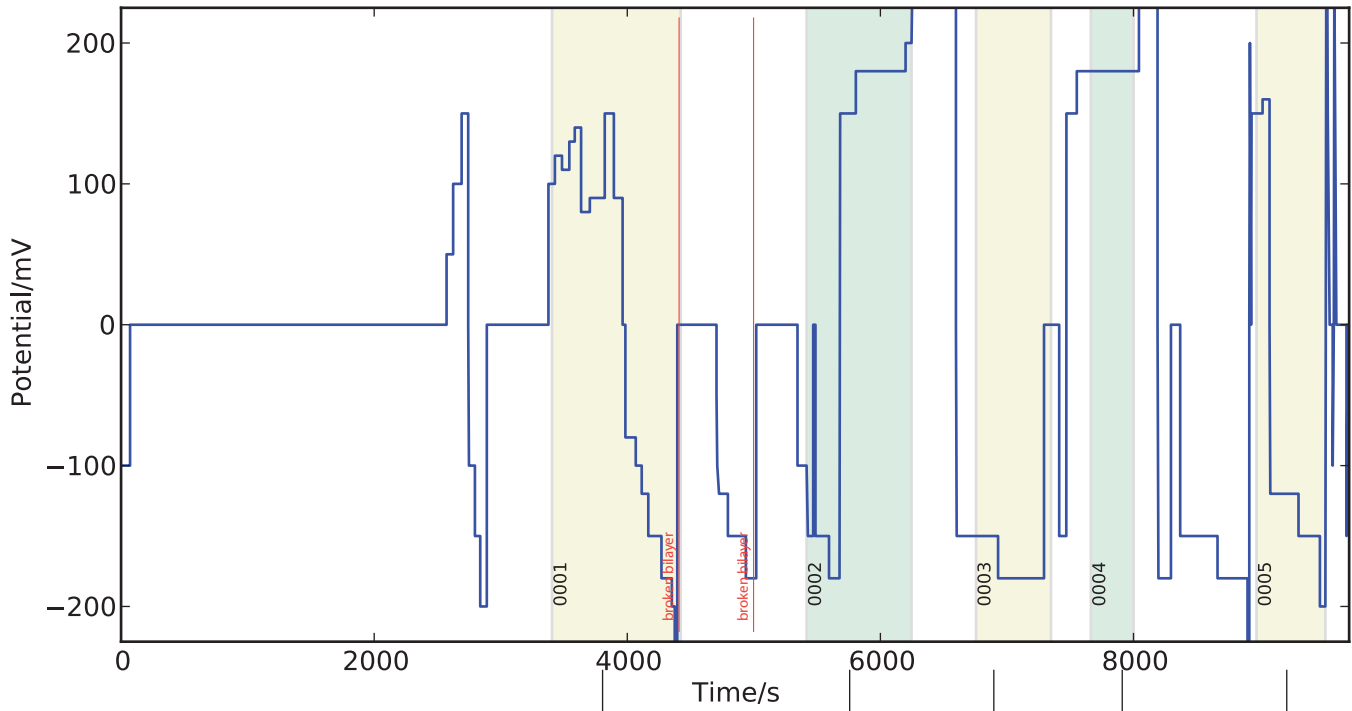




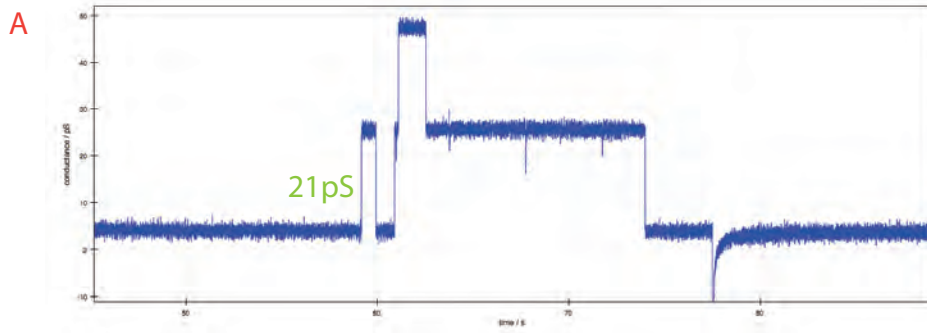
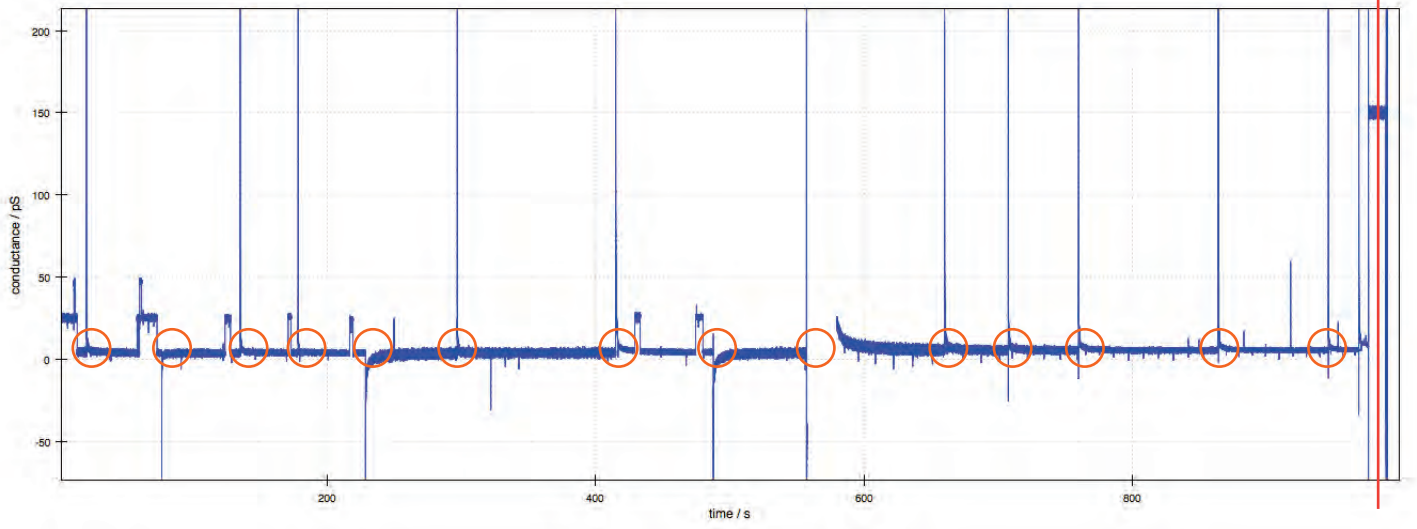


asymmetric electrolyte

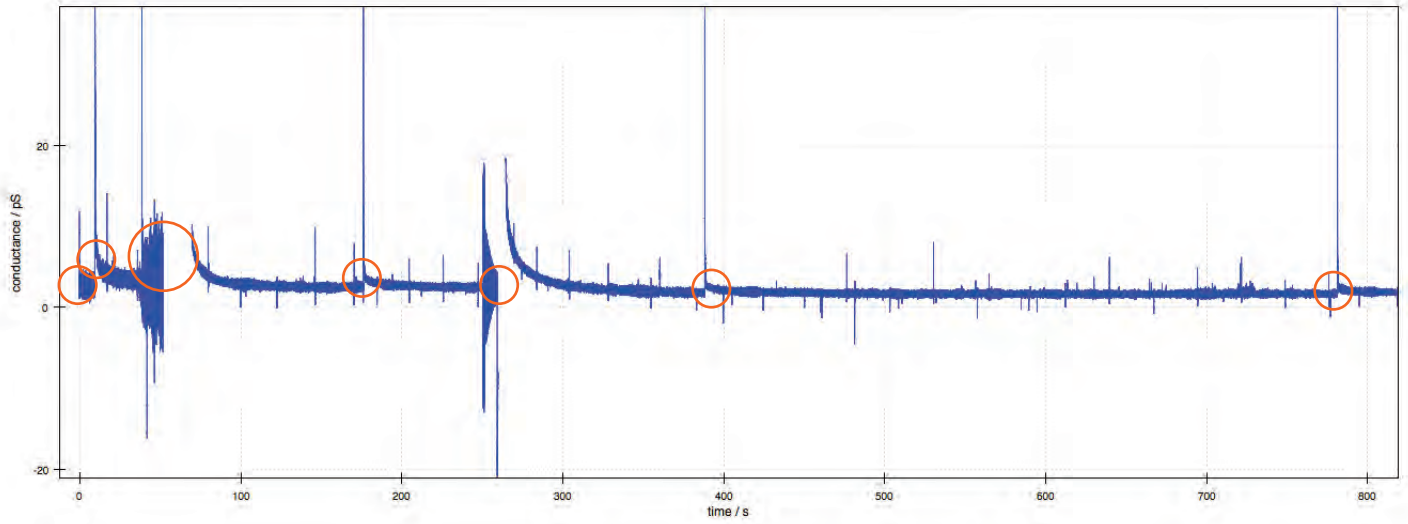
[JC-101] bCD6EsF4 200mM 1M CsCl pH 7 homoAdd



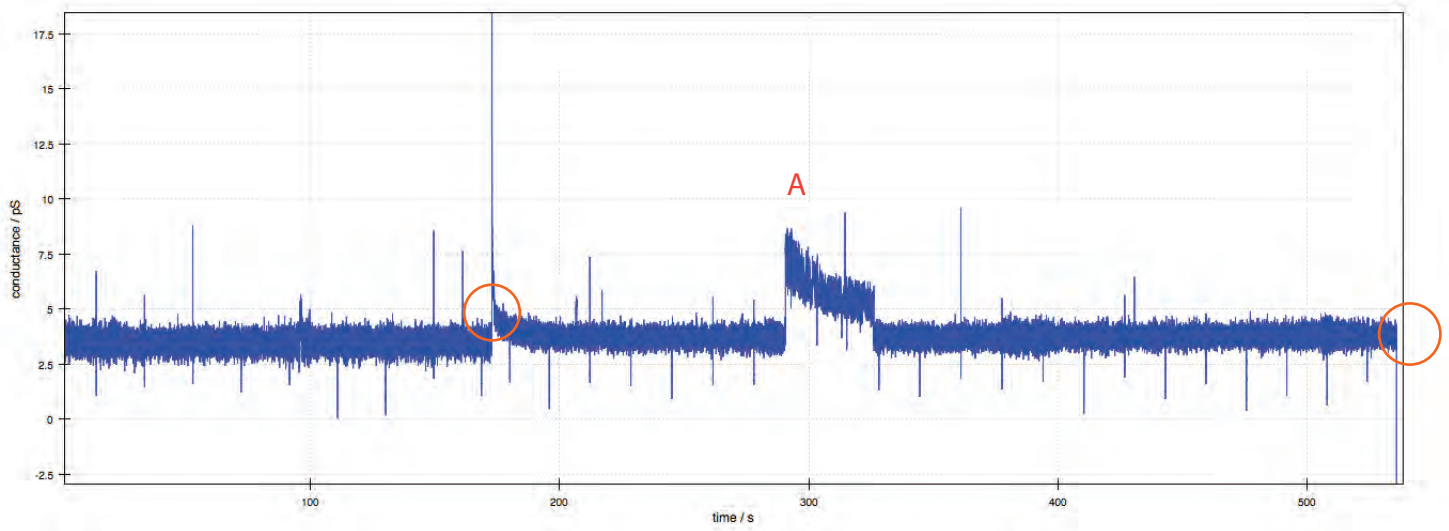
101-0001



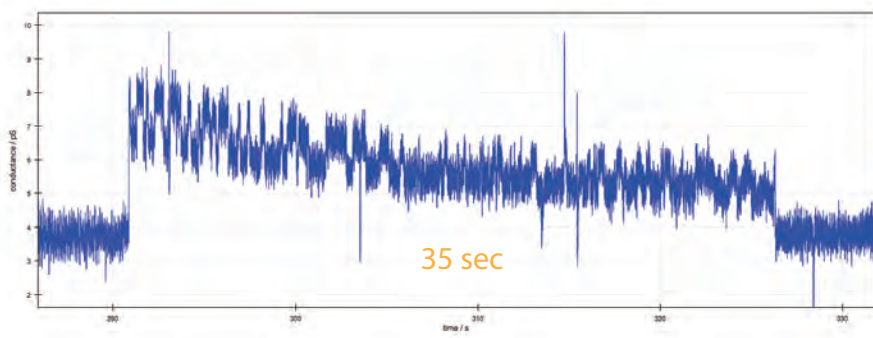
101-0002



101-0003

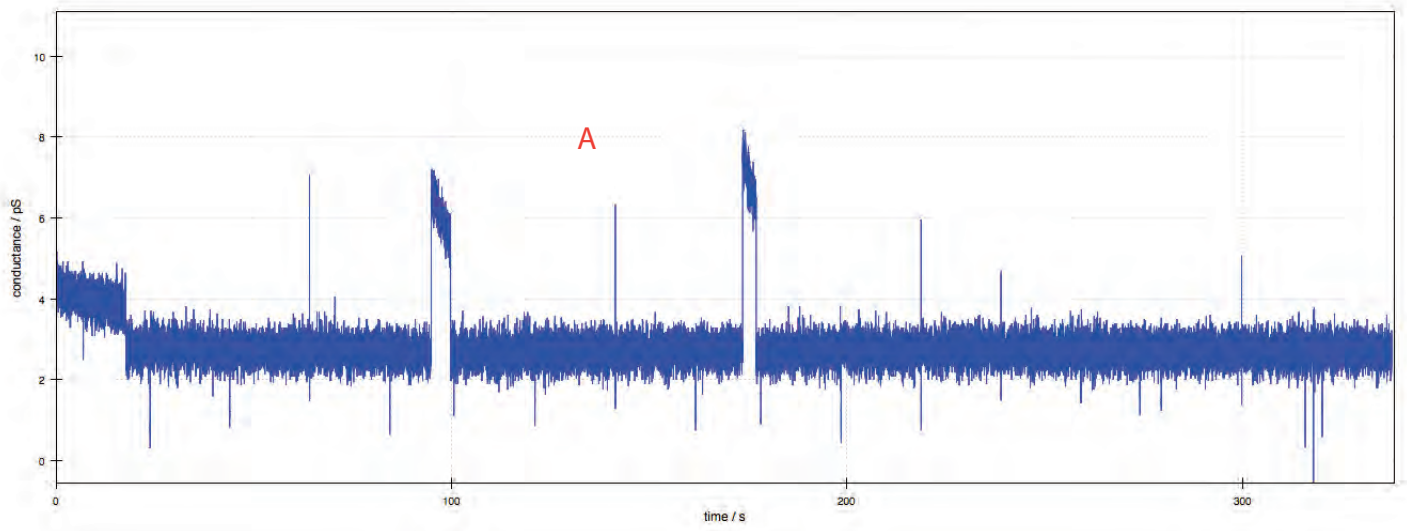


A

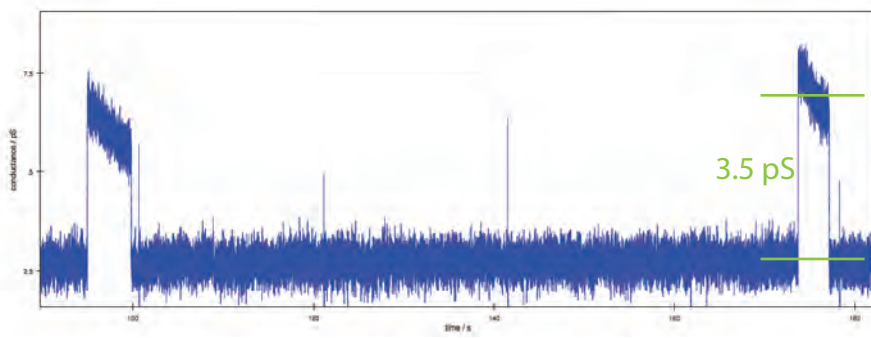


note the two-levelled flickering

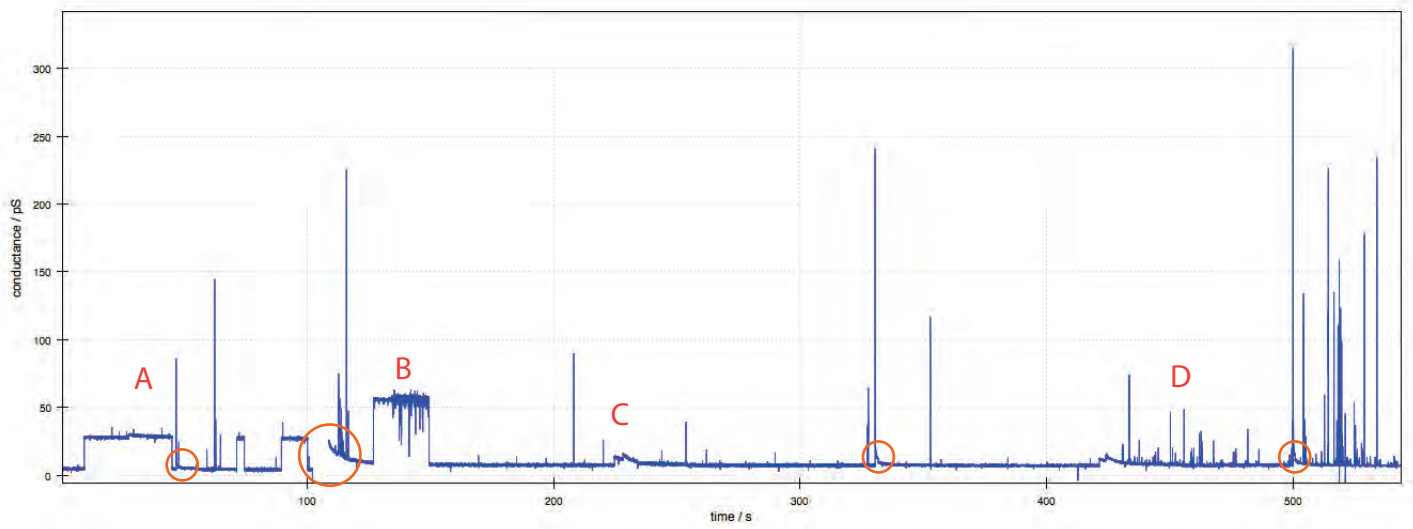
101-0004



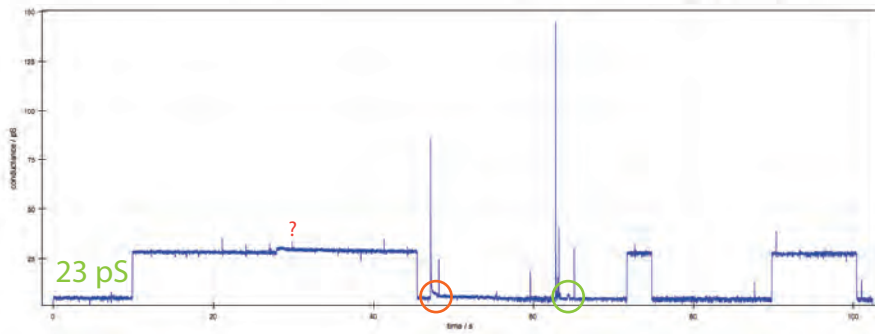
A



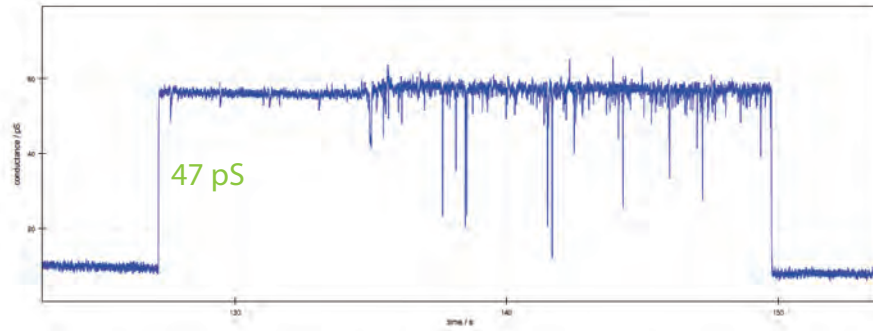
no flickering like 101-0003 seen



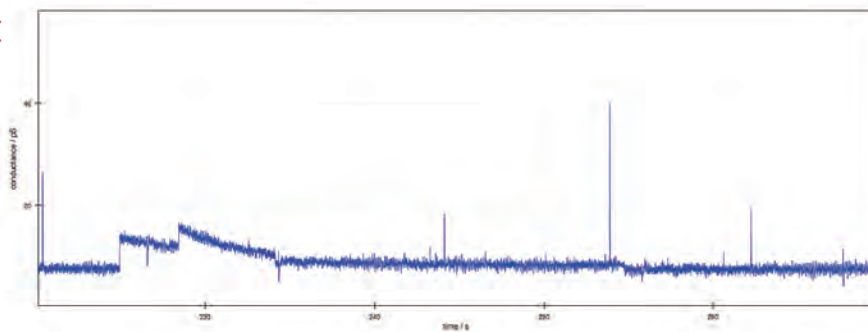
A



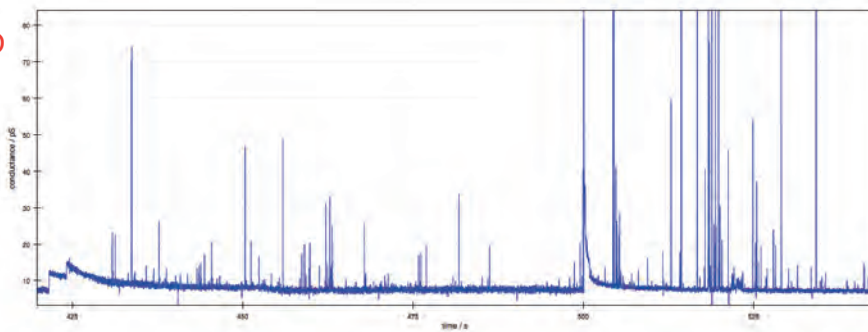
B



C

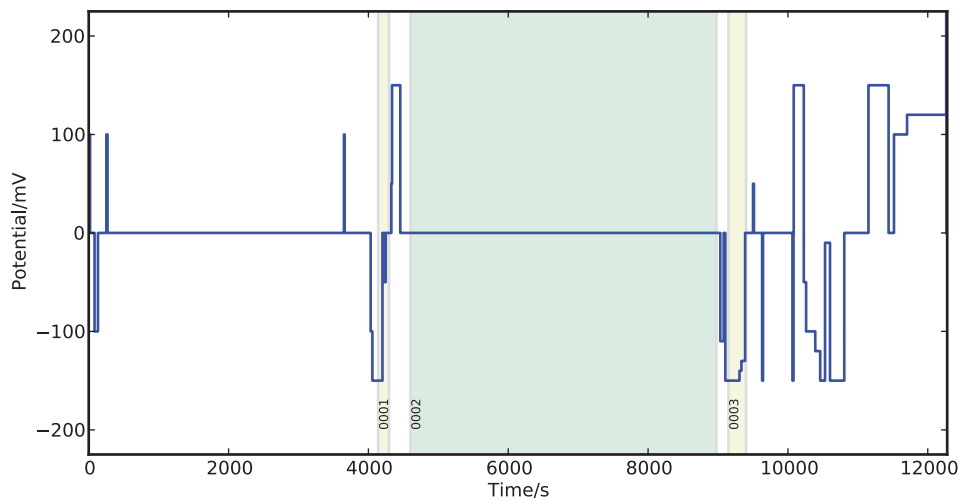


D



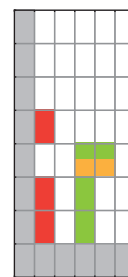
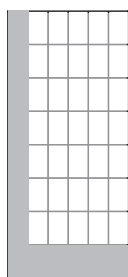
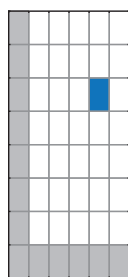
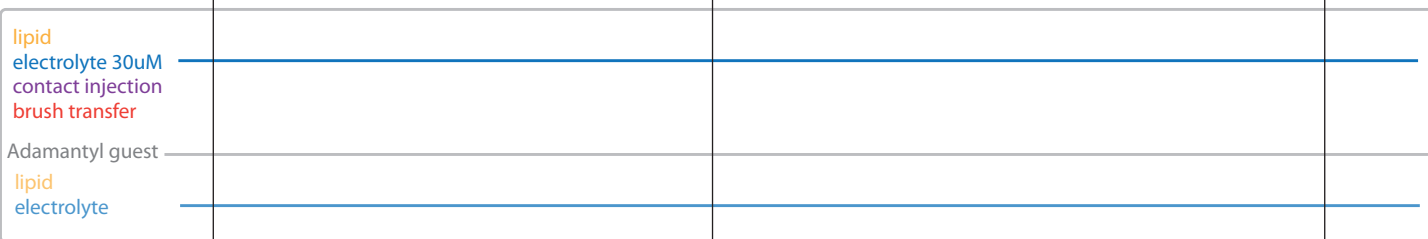
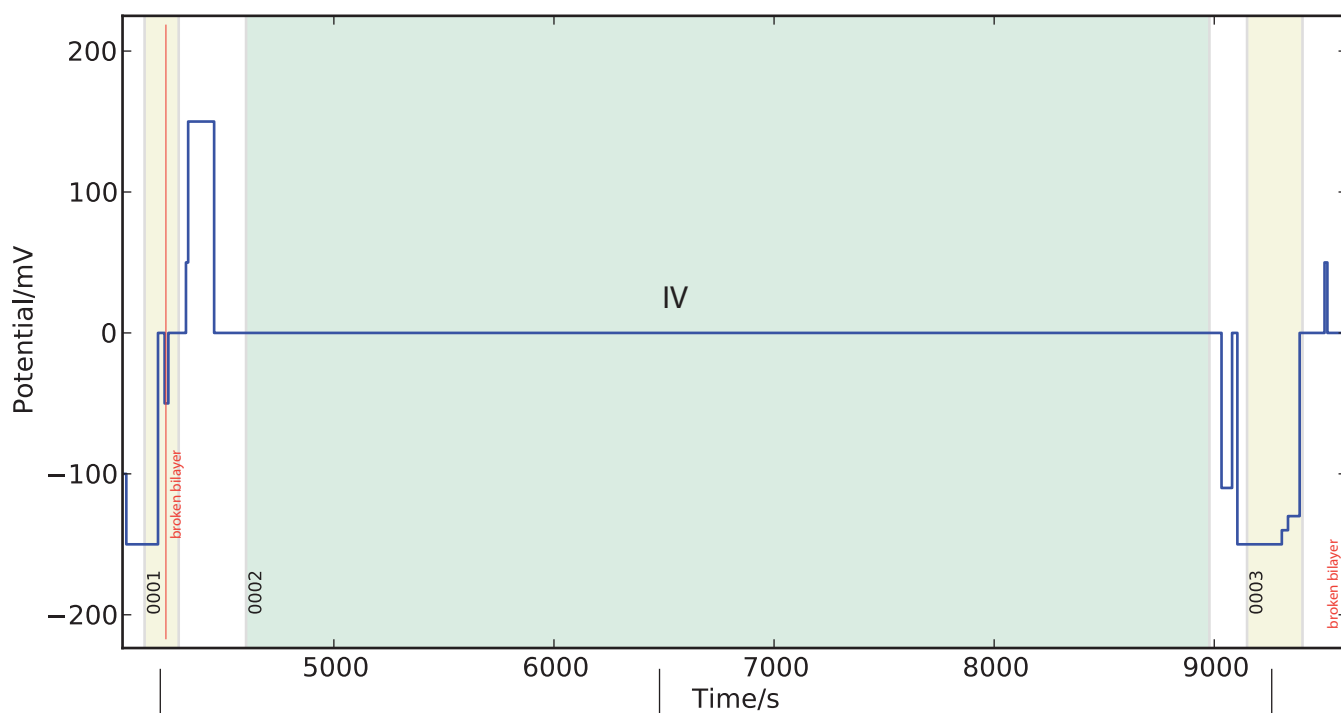
classified as all of blue, green and yellow

[JC-102] bCD6EsF4 200mM 1M CsCl pH 7 homoAdd (2)



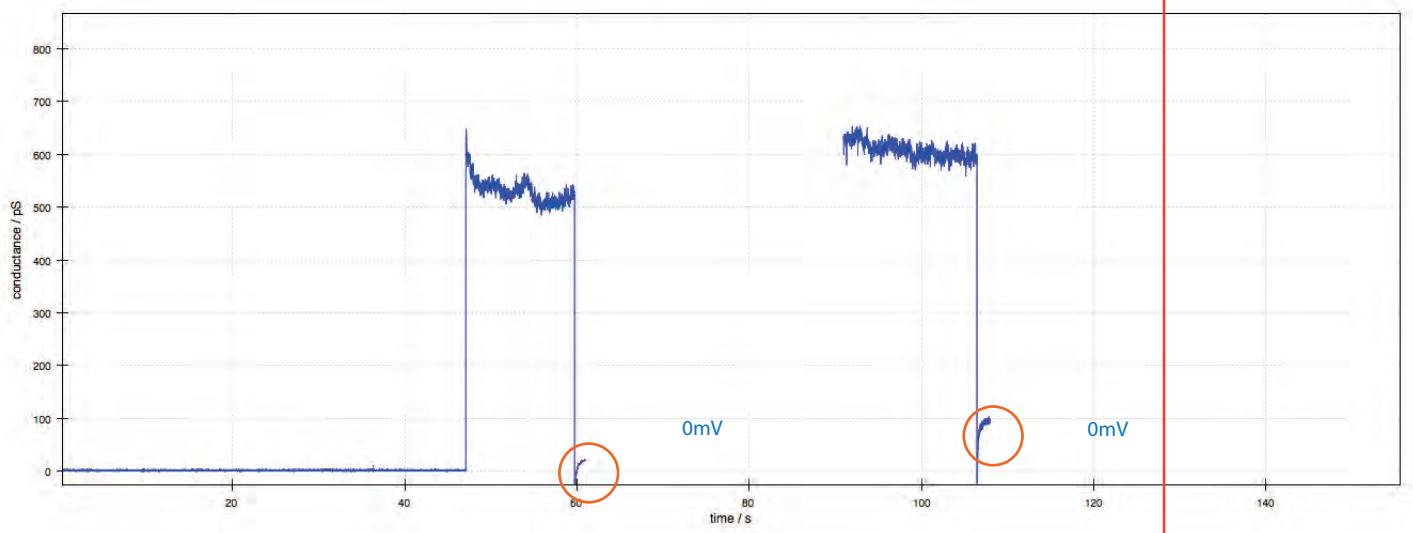
Asymmetric electrolyte

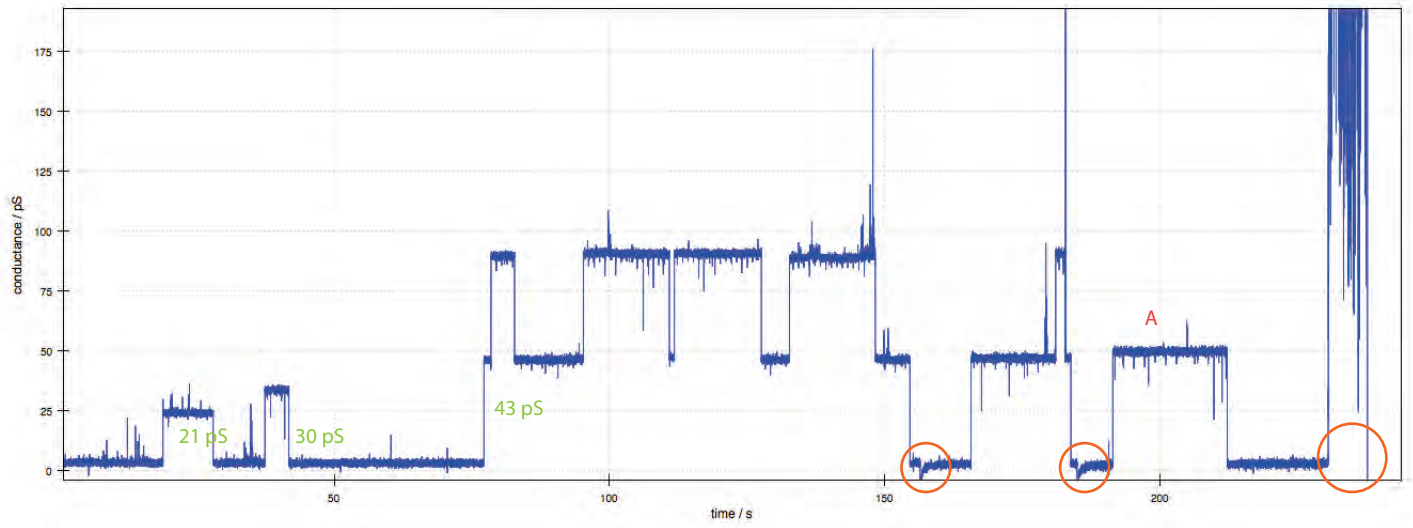
[JC-102] bCD6EsF4 200mM 1M CsCl pH 7 homoAdd (2)



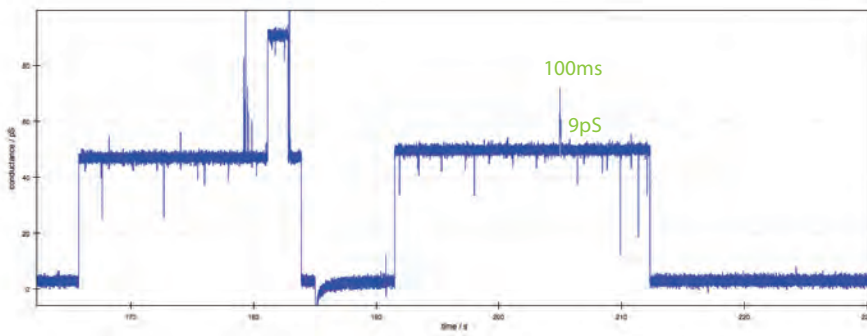
-100 -> 100mV,
10mV steps

reversal potential 22.6mV



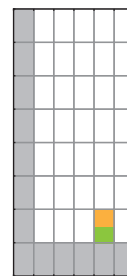
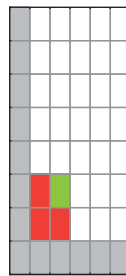
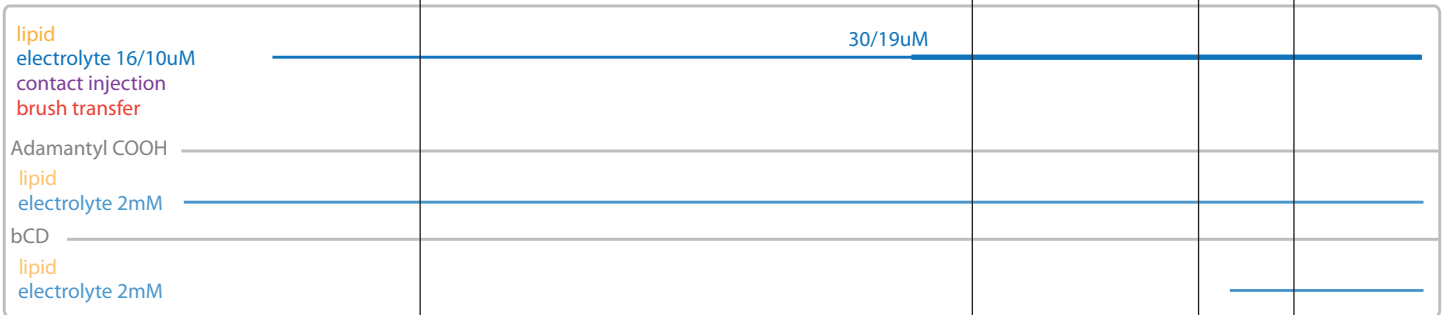
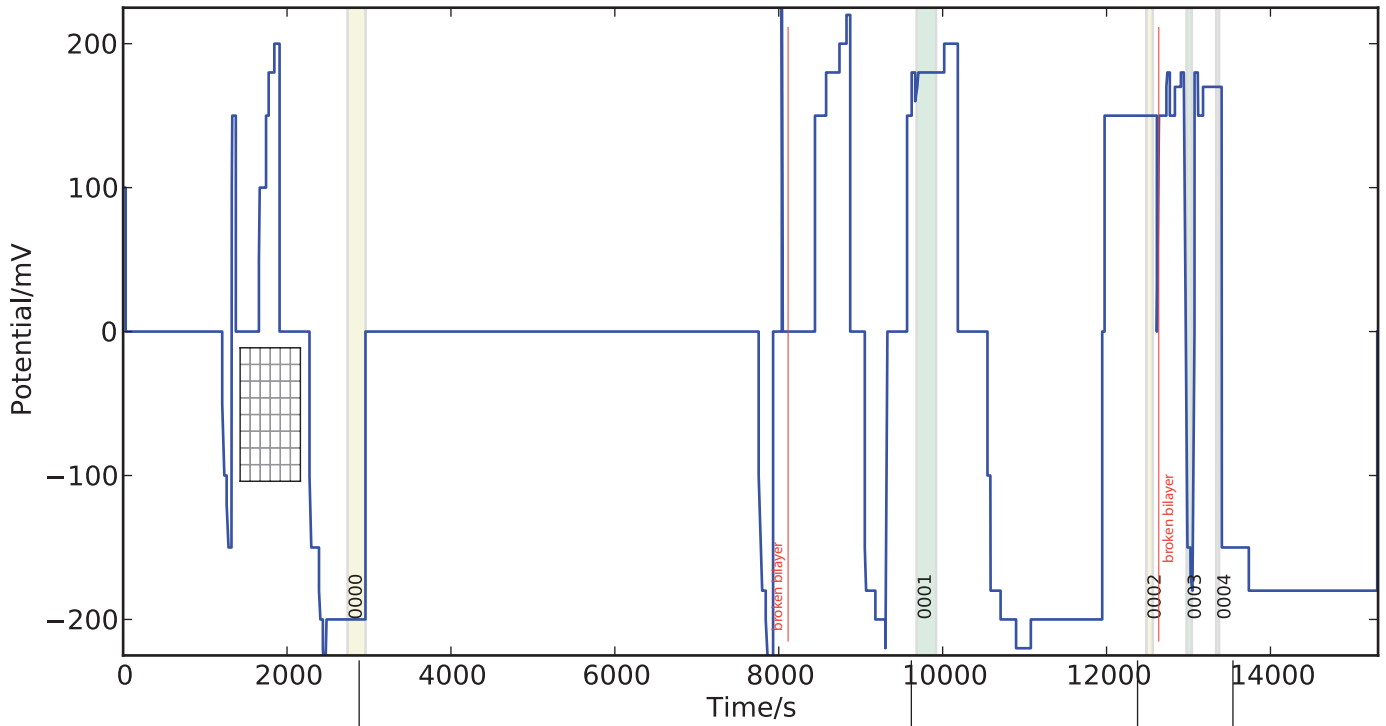


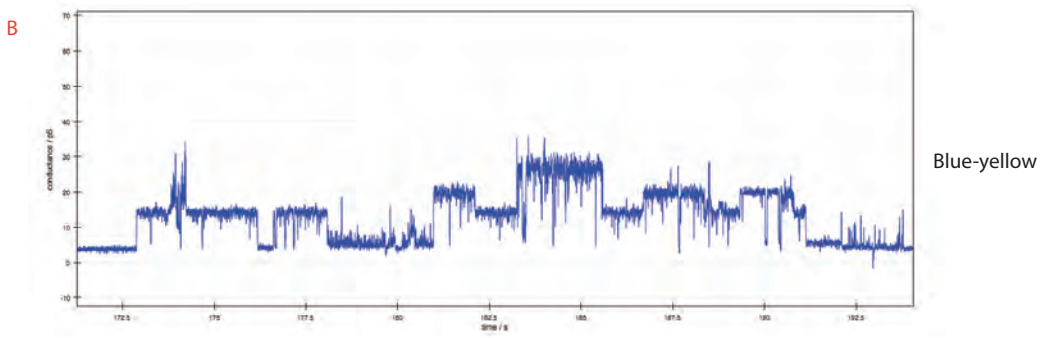
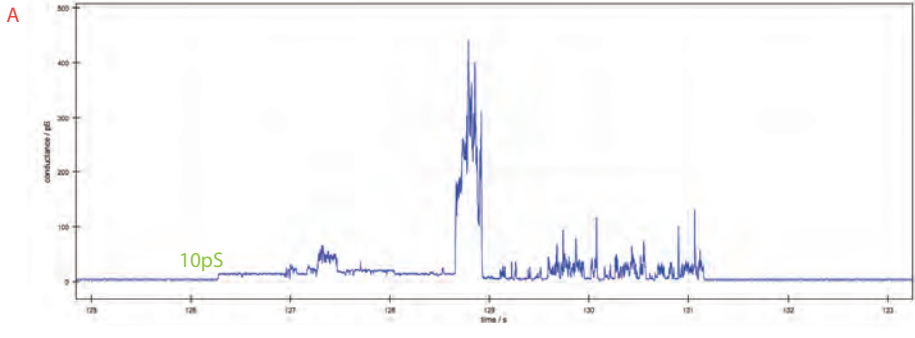
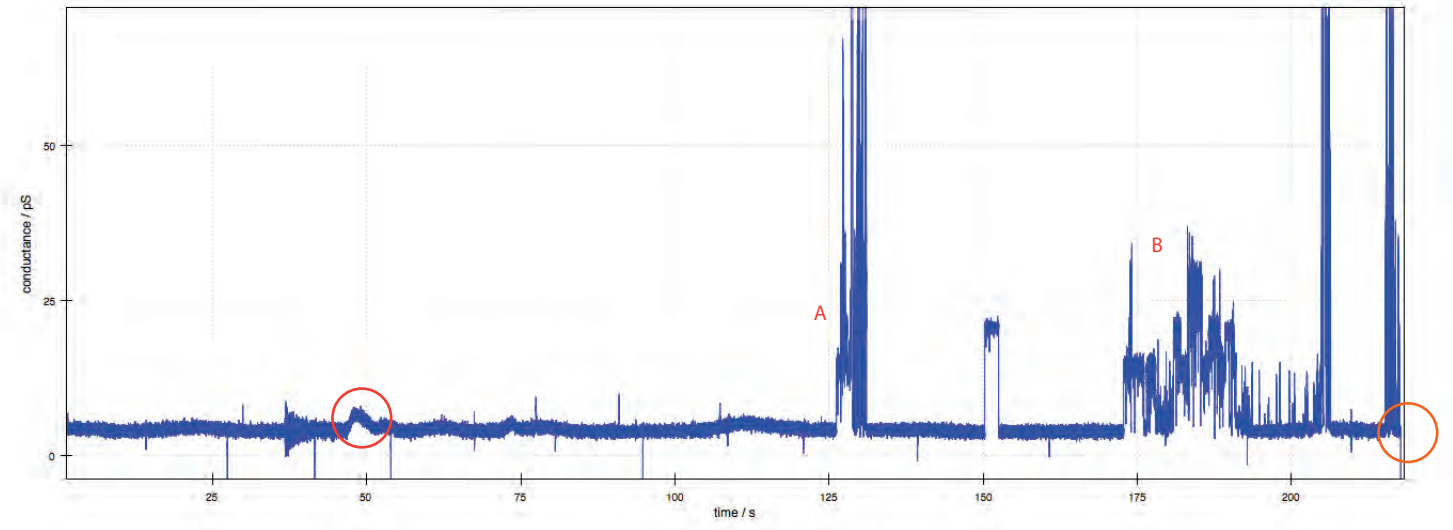
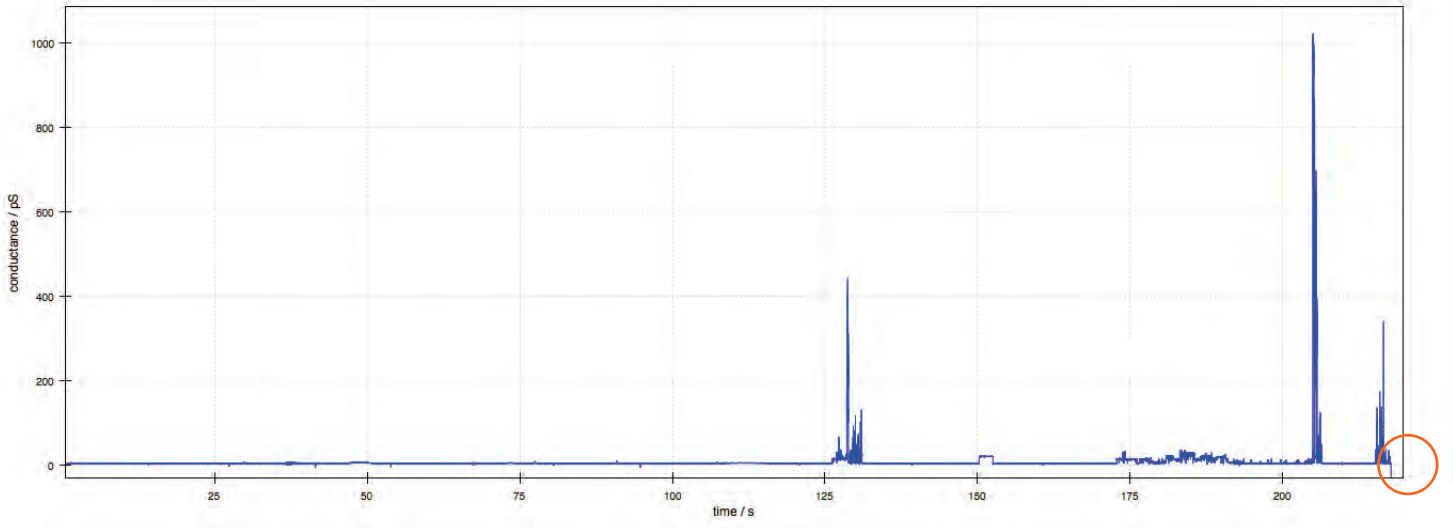
A

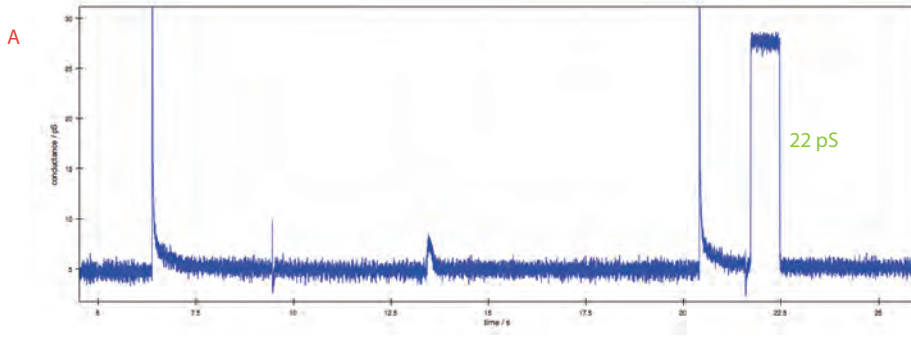
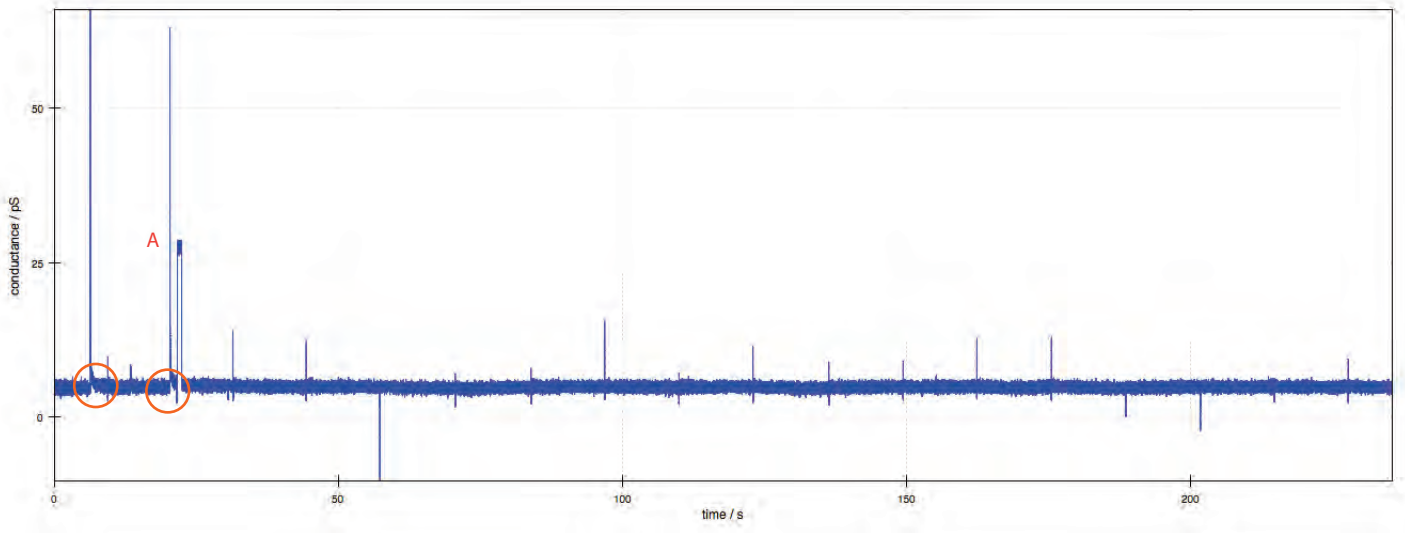


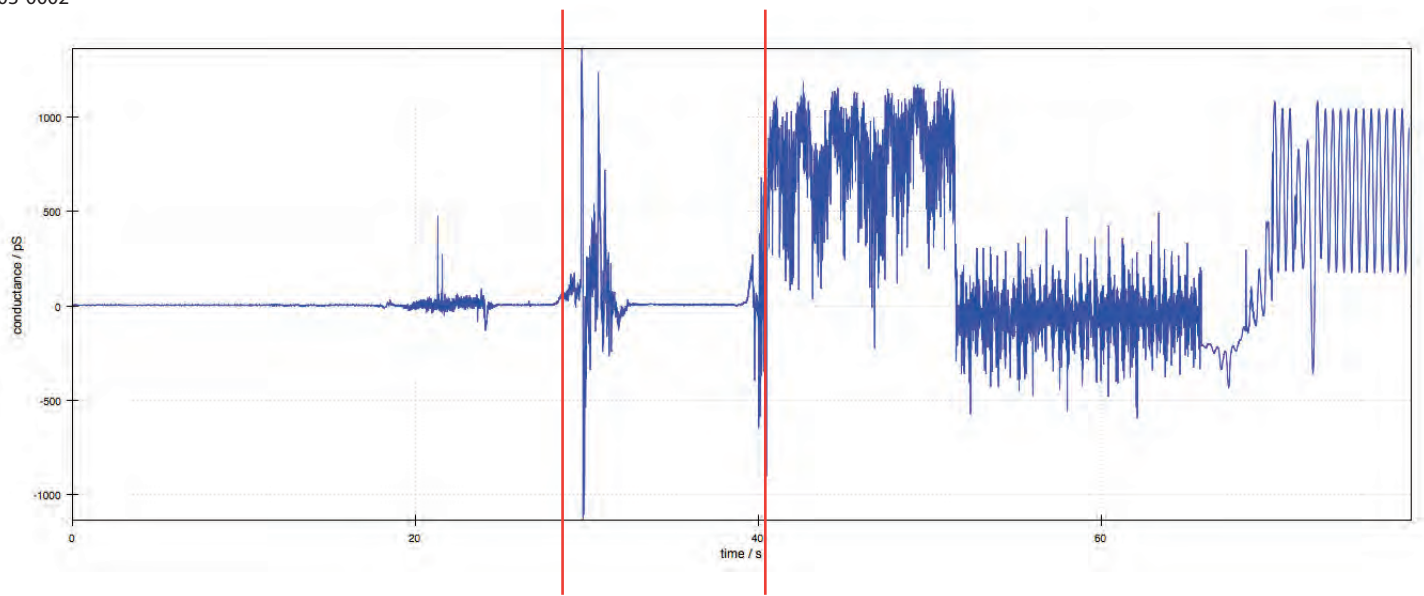
flickering absent in baseline sans opening

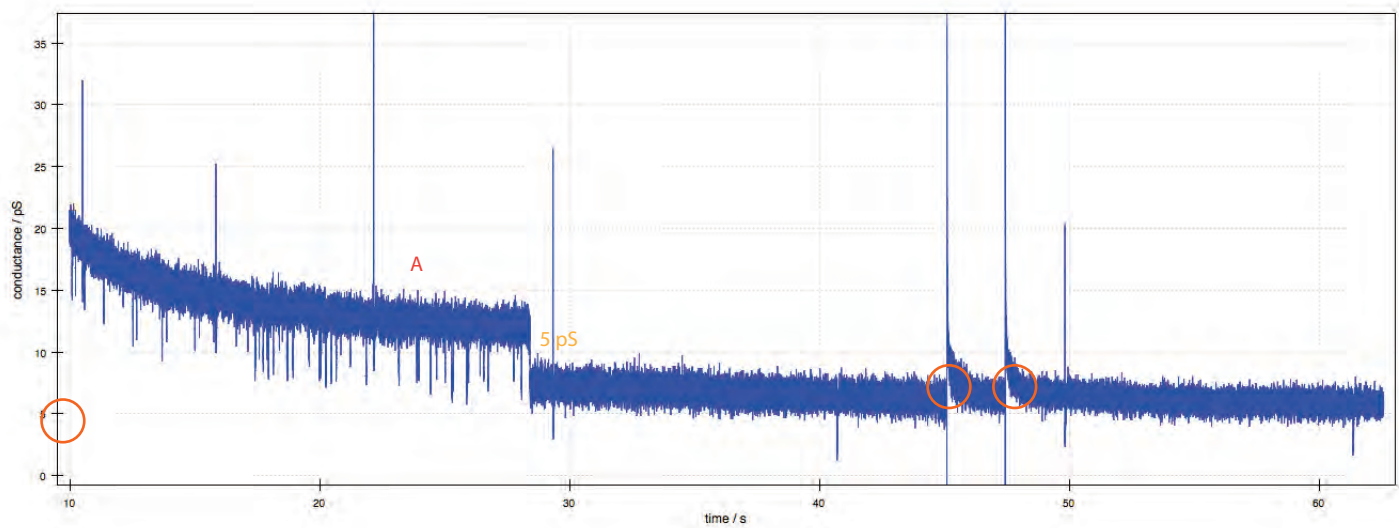
[JC-103] bCD6EsF4 200mM CsCl pH7 2mM AdCOO



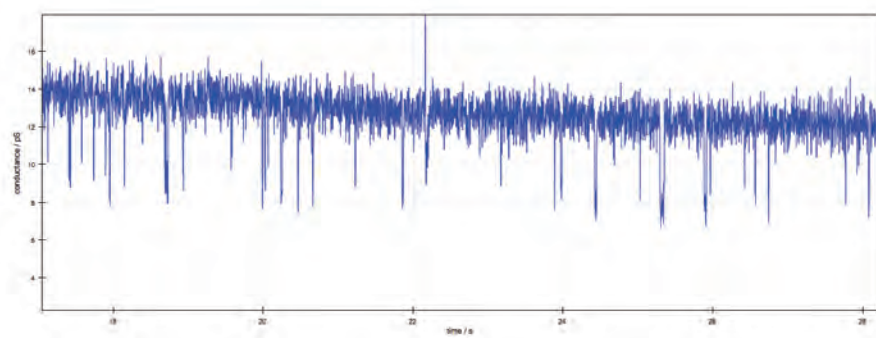


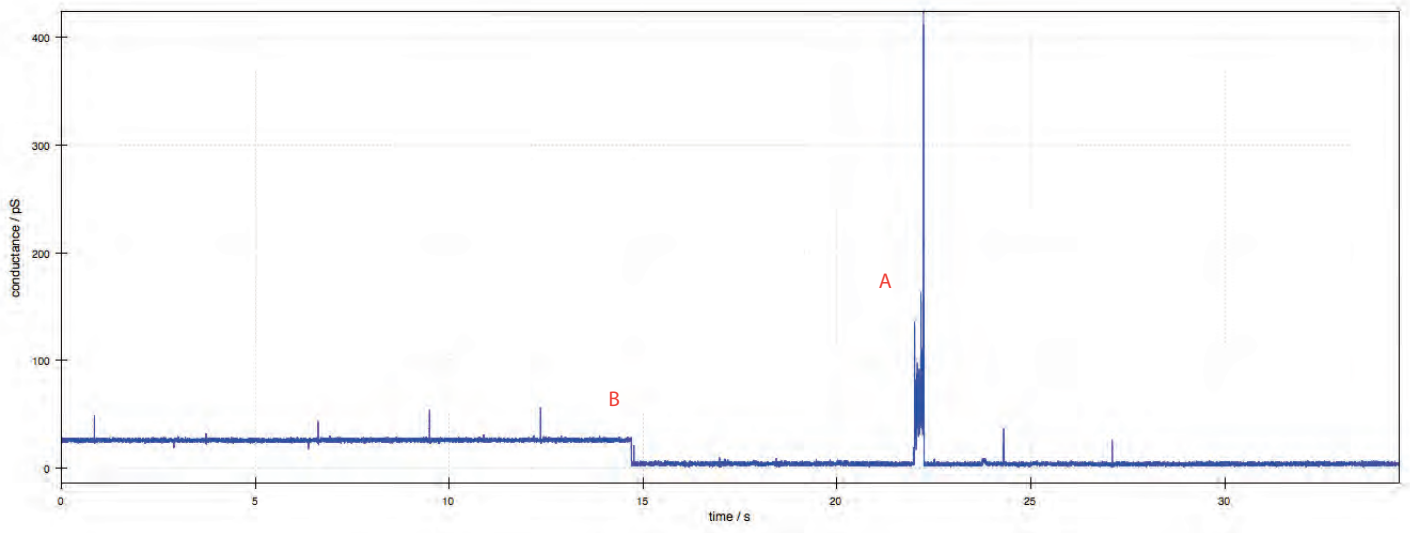




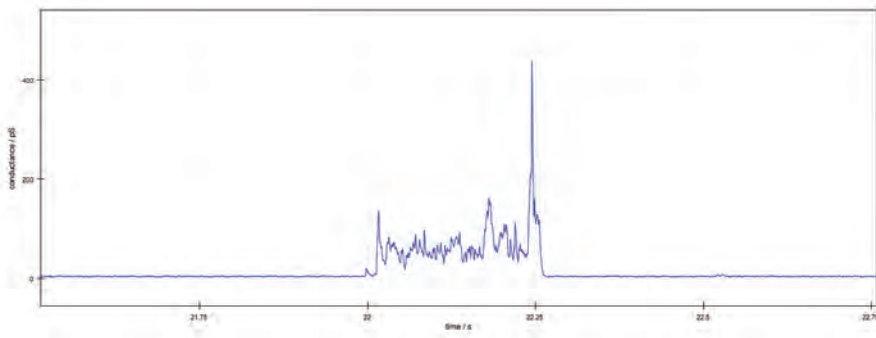


A

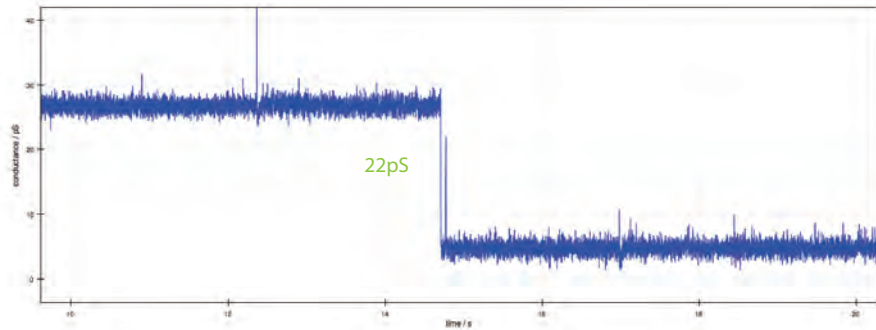




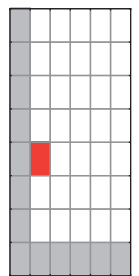
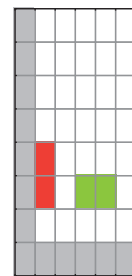
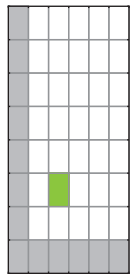
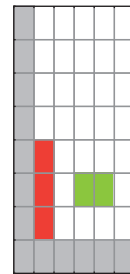
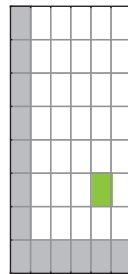
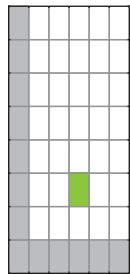
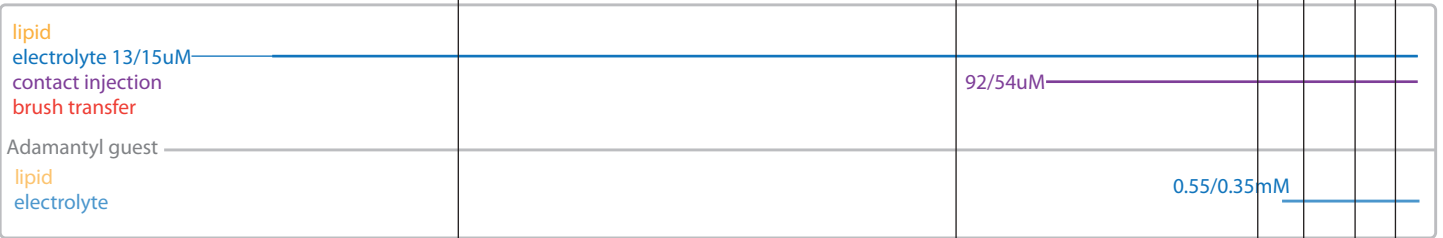
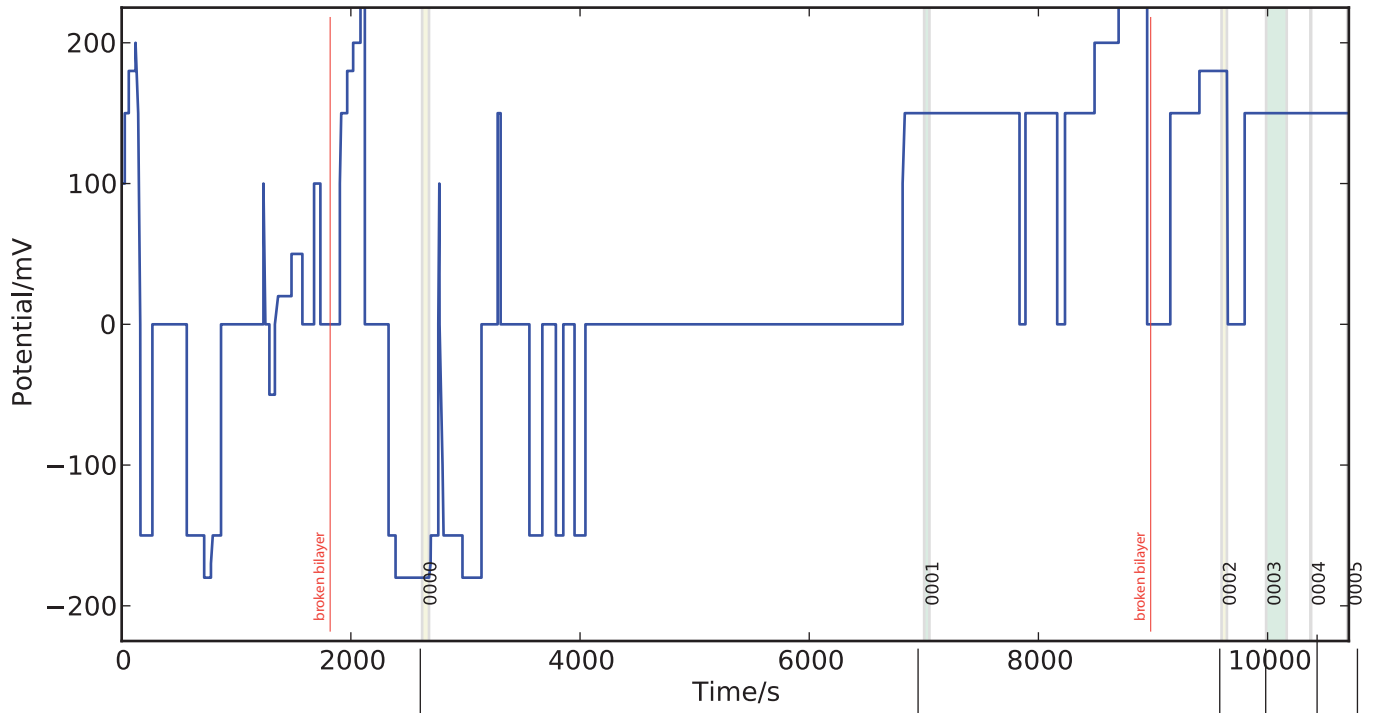
A

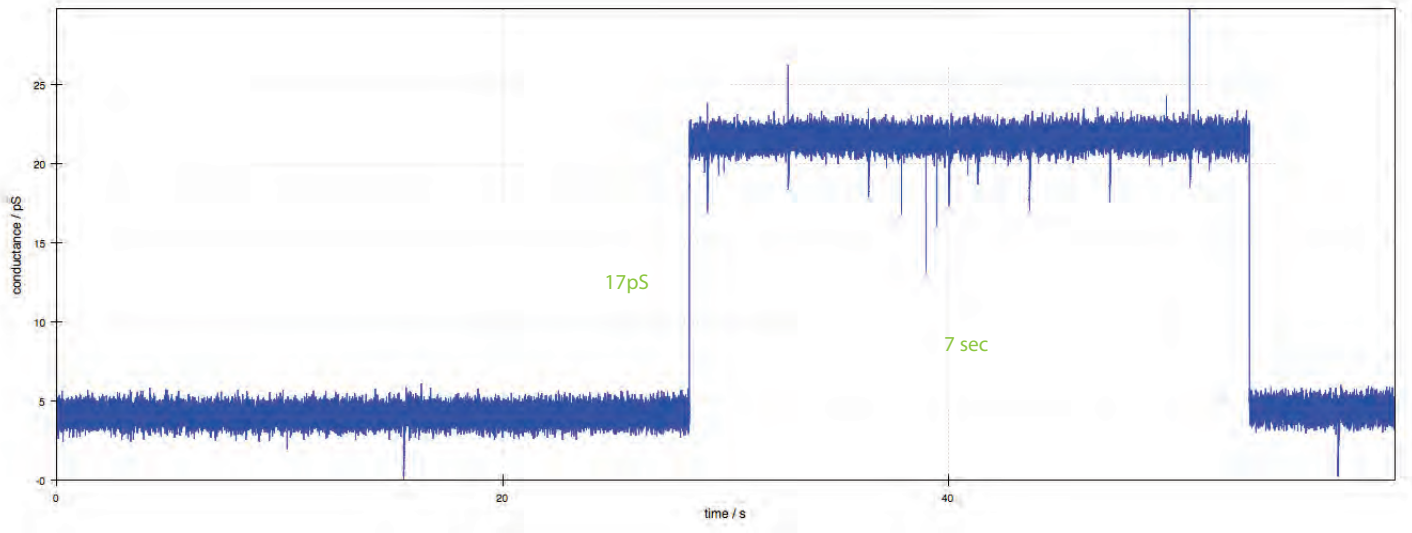


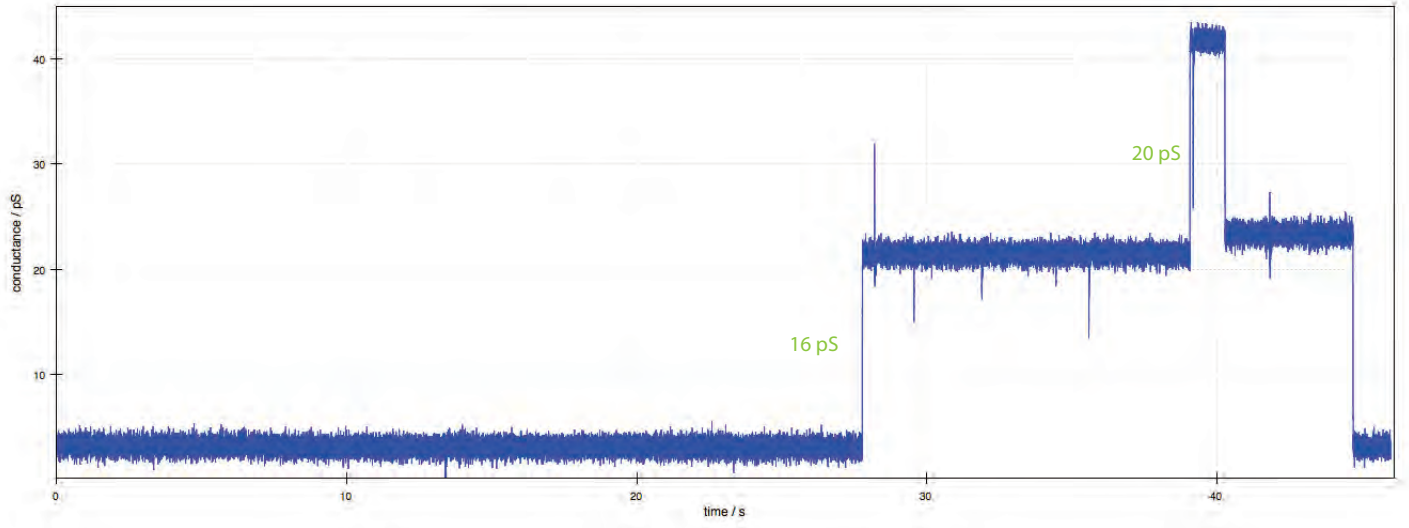
B



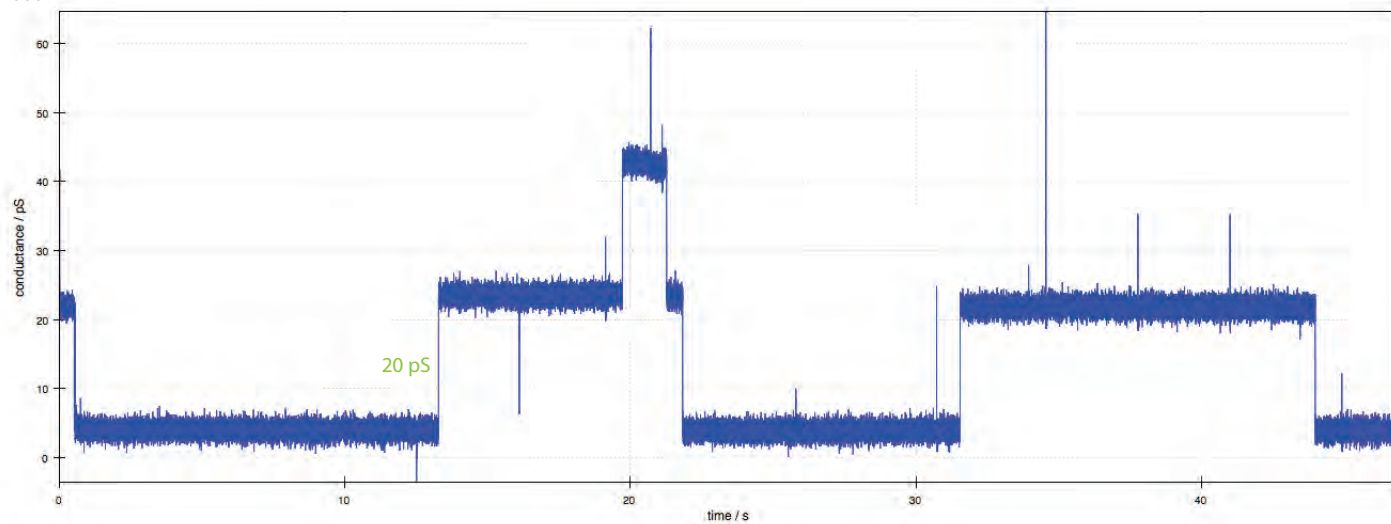
[JC-105] bCD6EsF4 200mM CsCl AdNH3 block



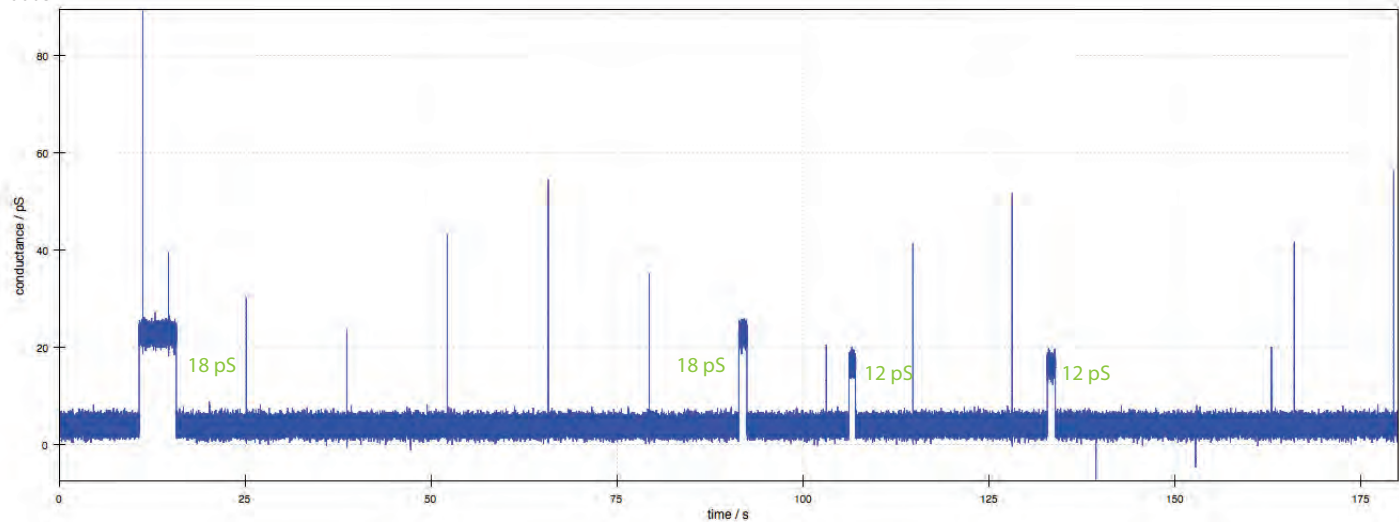


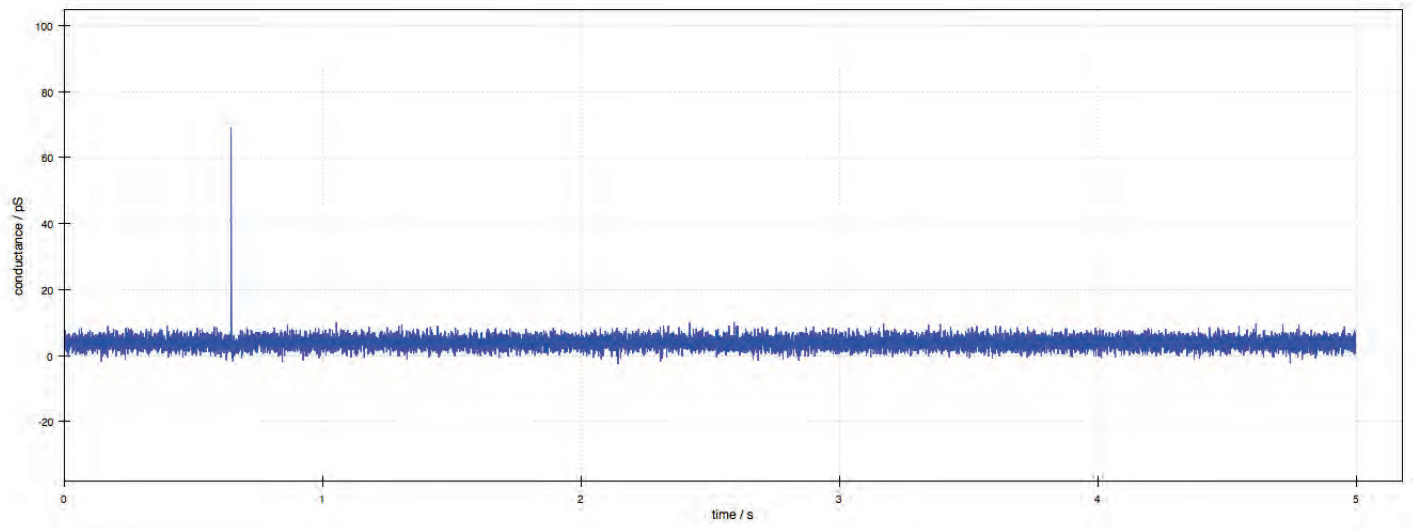


105-0002

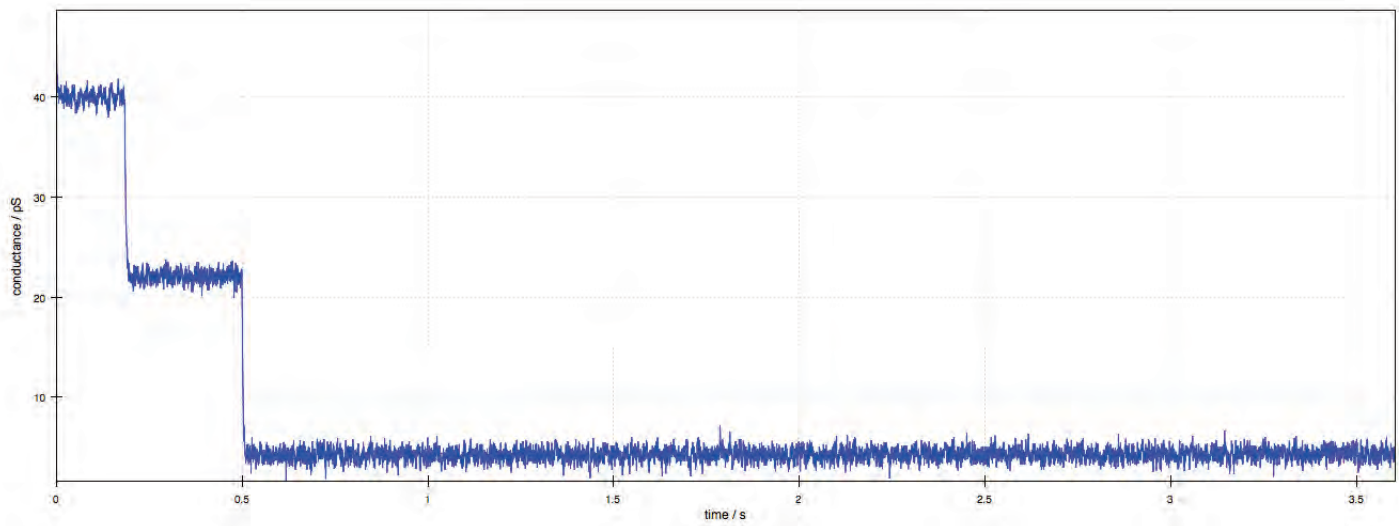


105-0003



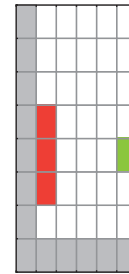
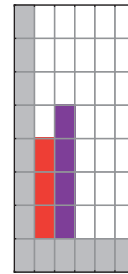
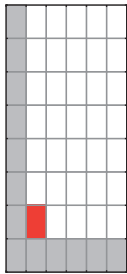
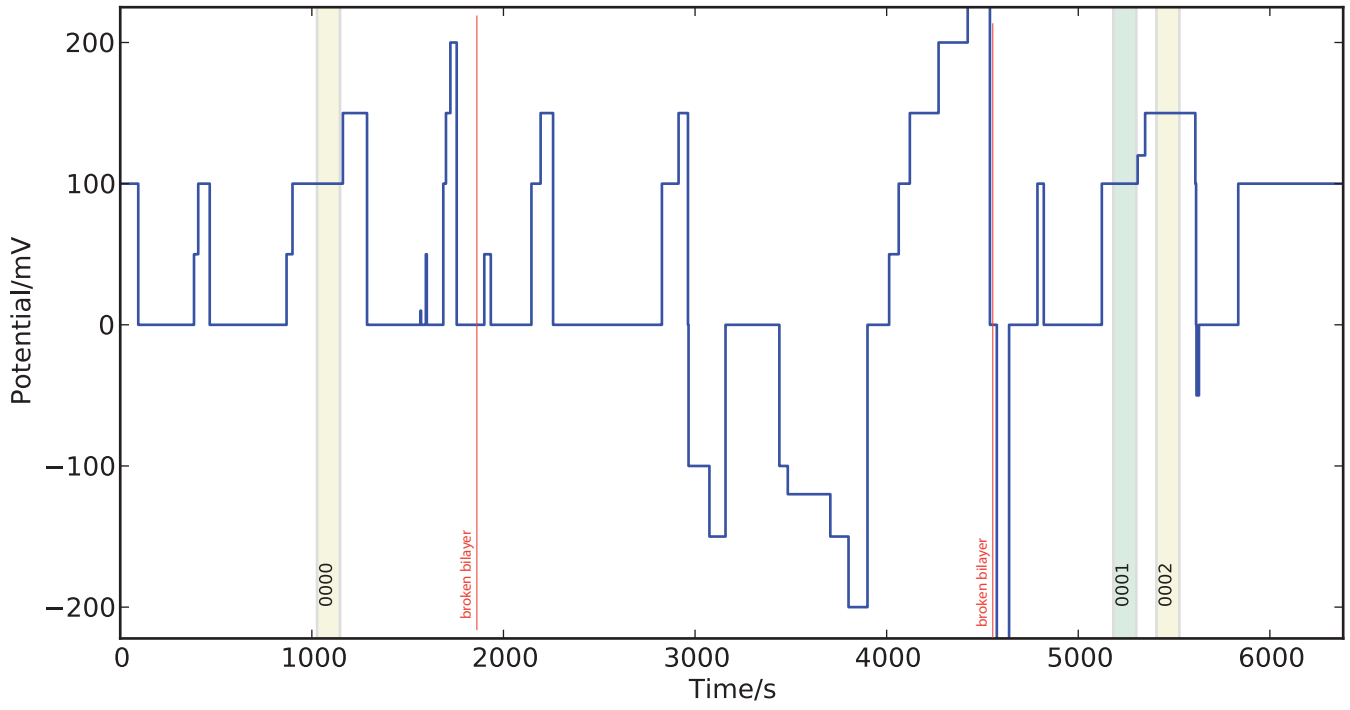


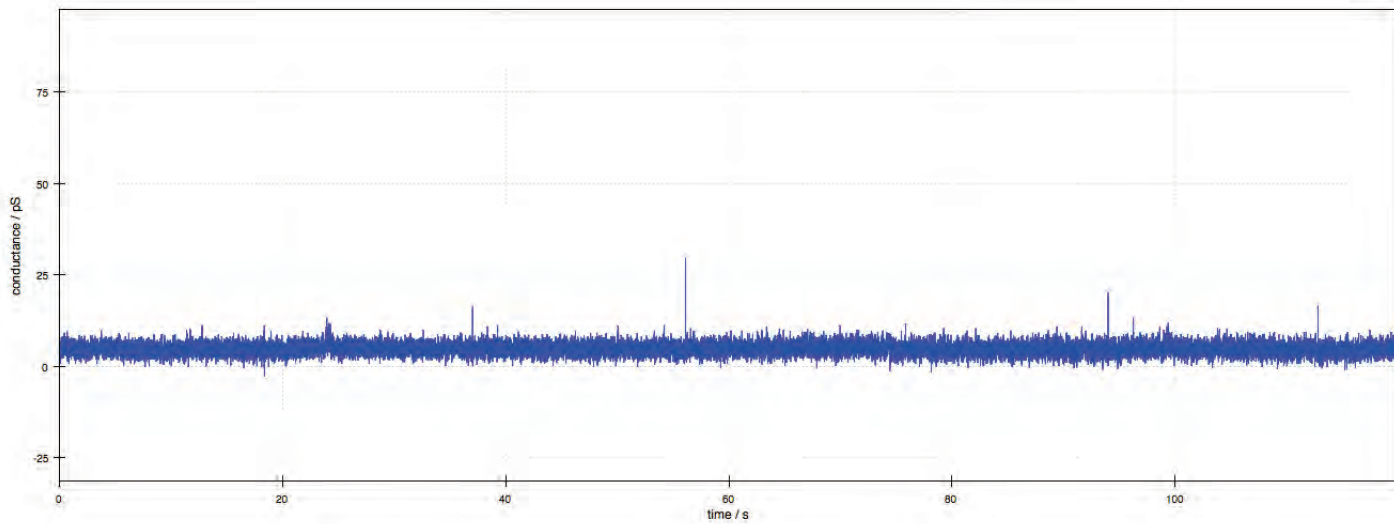
Shortest trace ever.

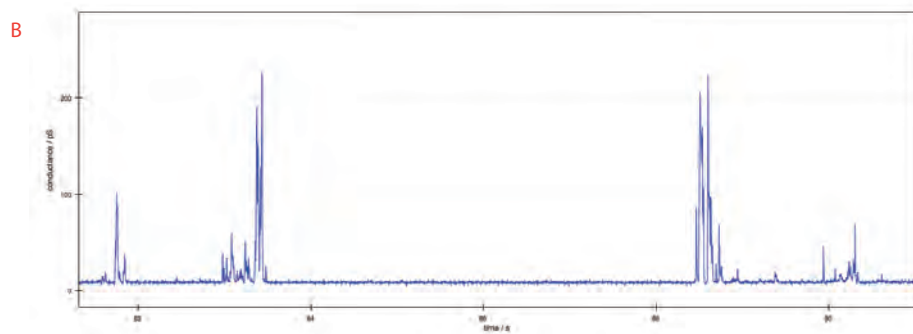
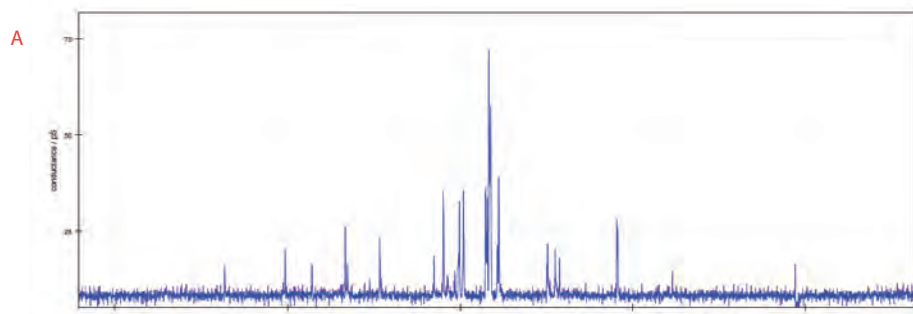
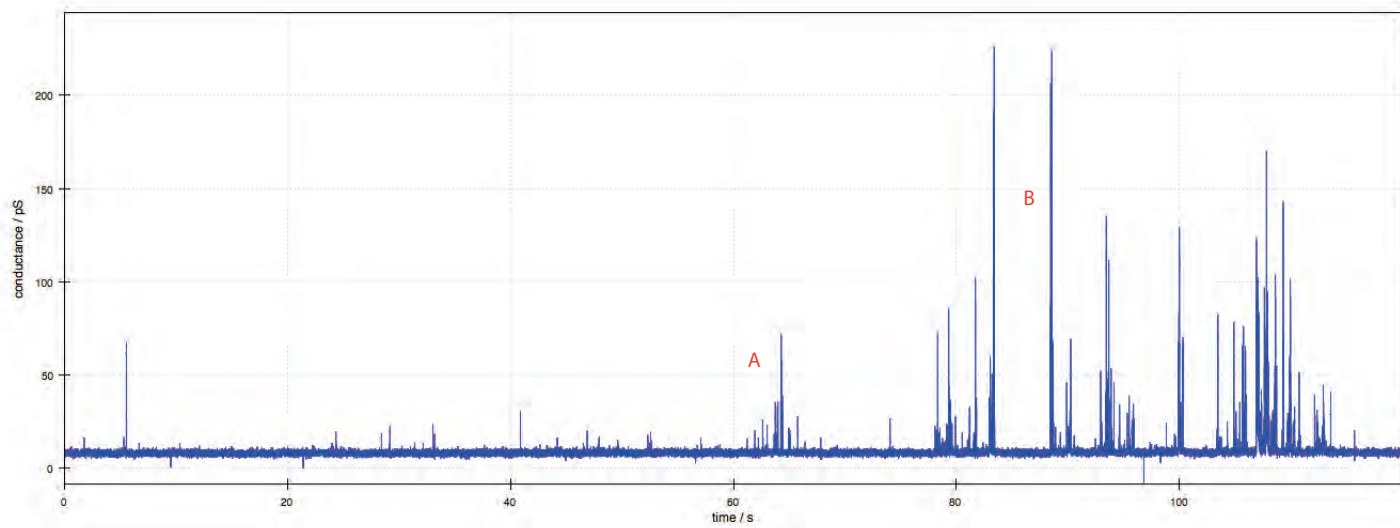


Nope, THIS is the shortest trace ever. Zing!

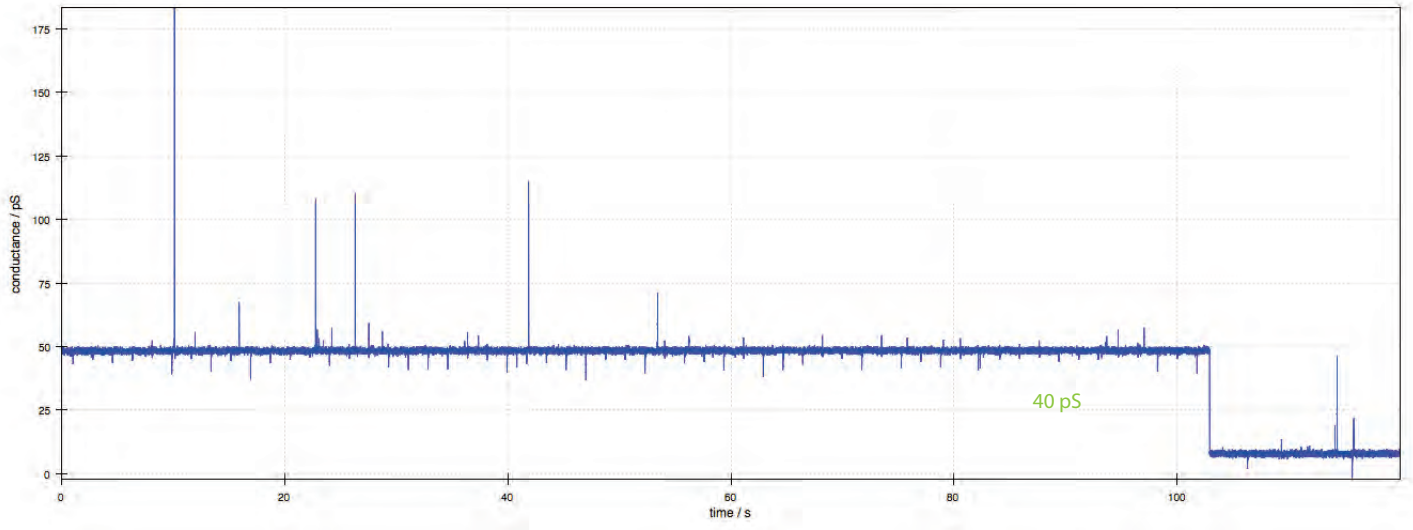
[JC-113] bCD6EsF4 1M CsCl pH 7 test for gram-hybrid



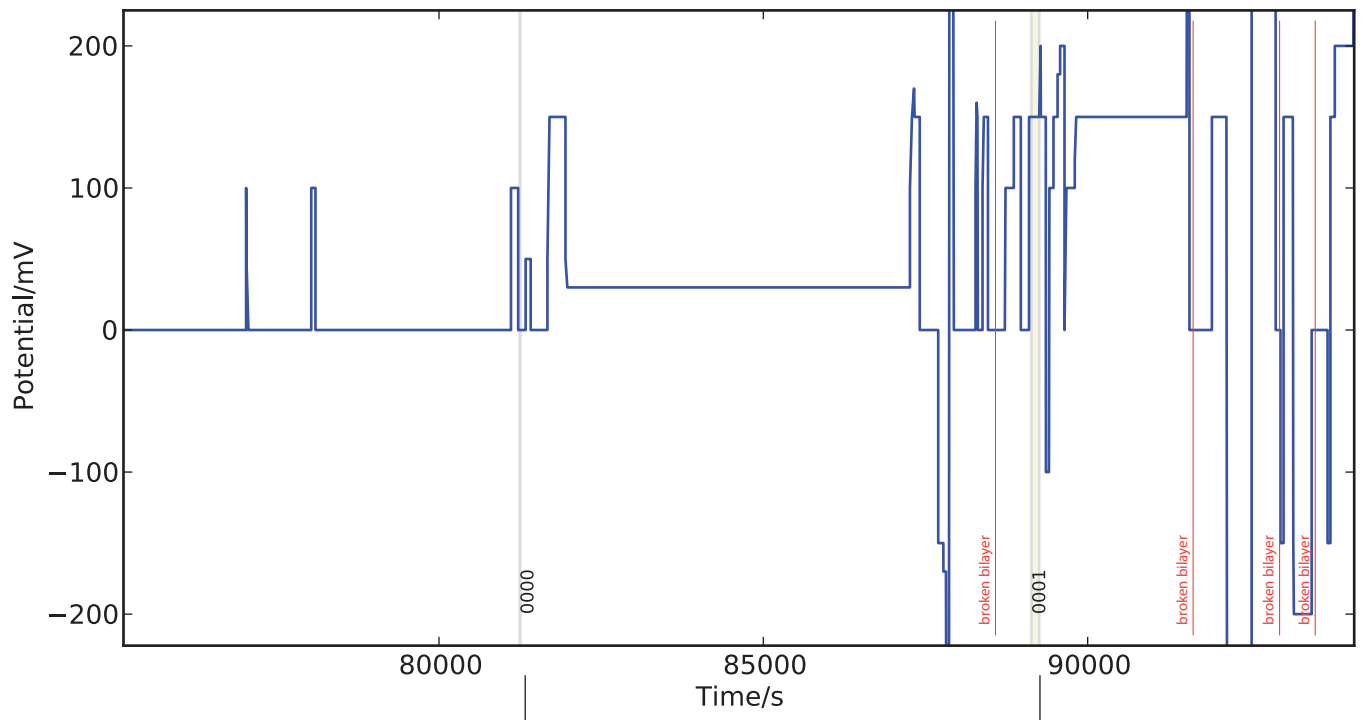




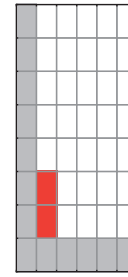
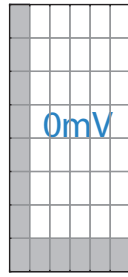
112-0002

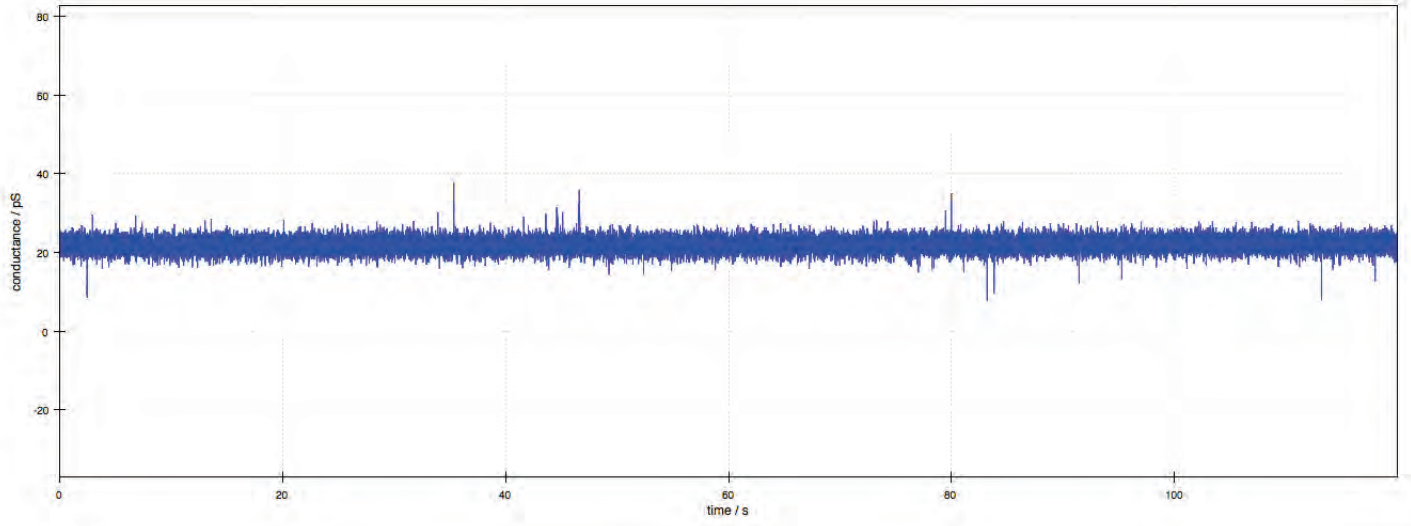


[JC-115] bCD6EsF4 1M CsCl pH 7 test for gram-hybrid

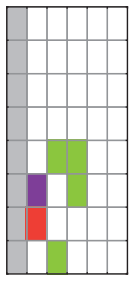
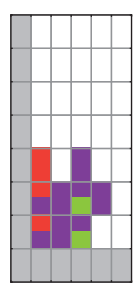
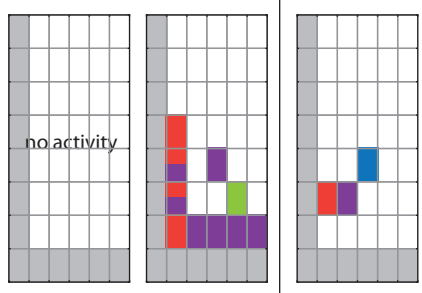
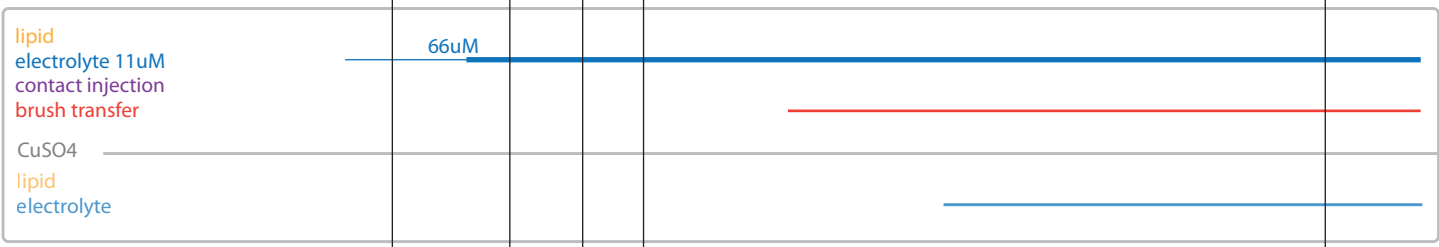
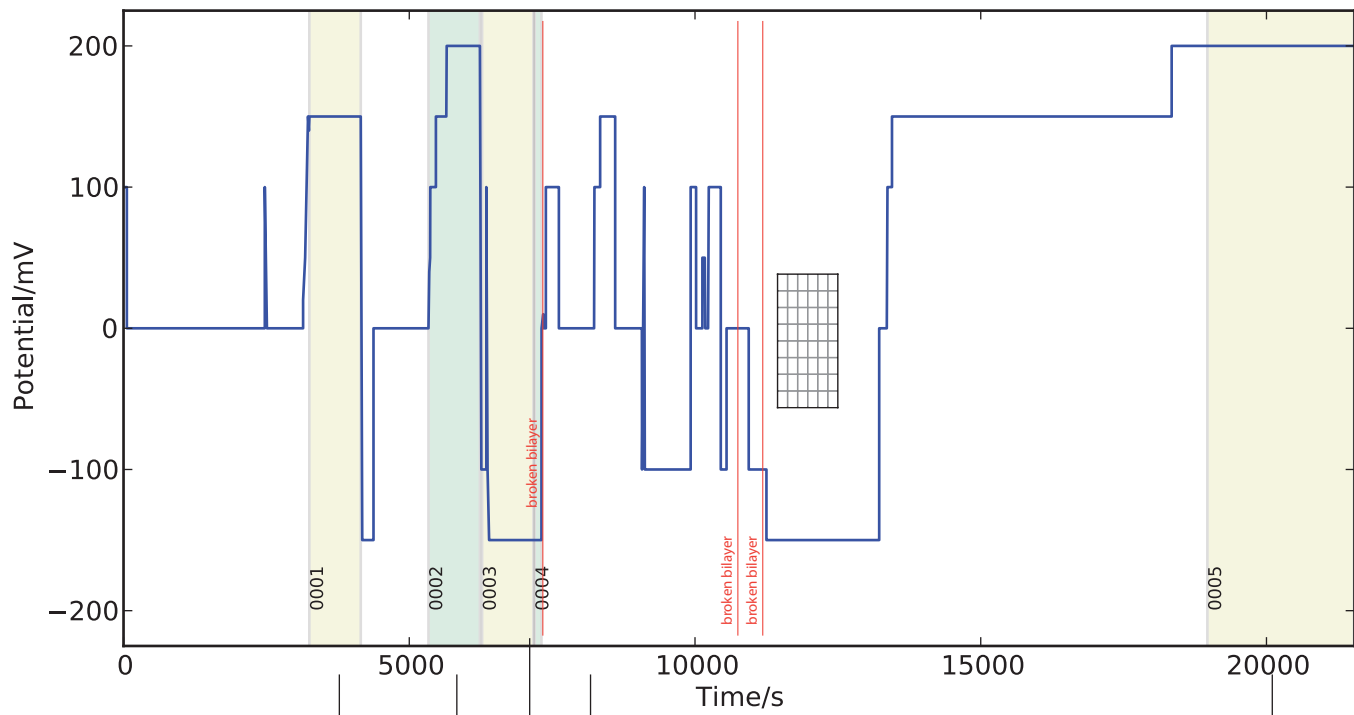


lipid
electrolyte 30/20uM
contact injection
brush transfer

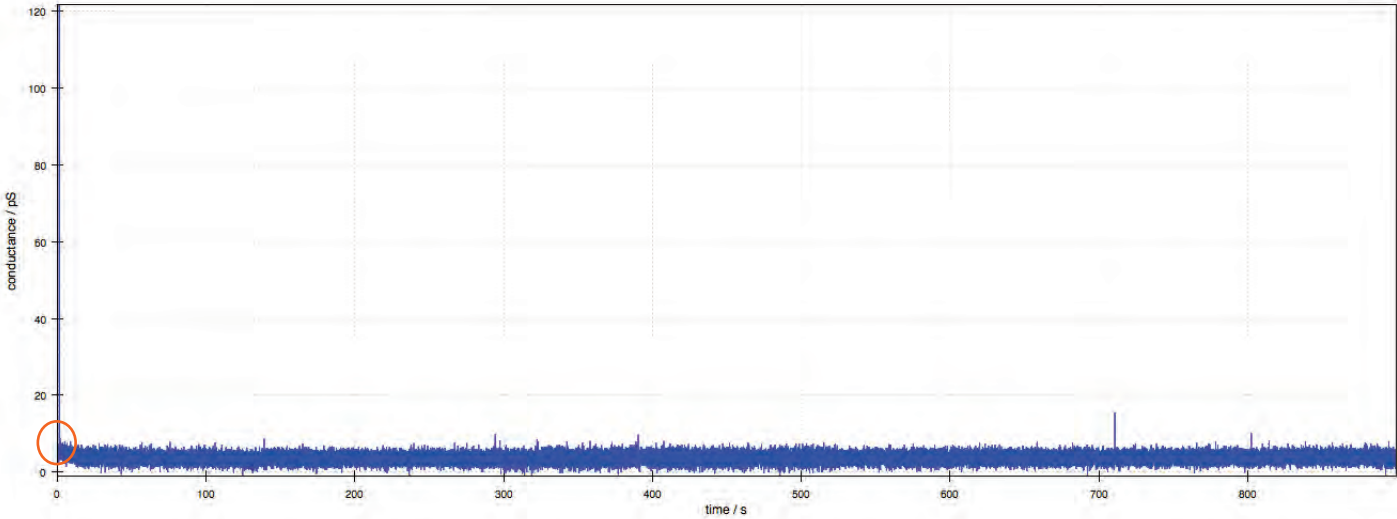


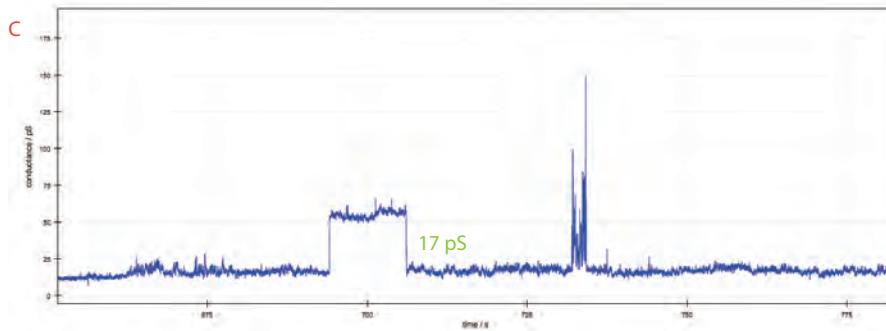
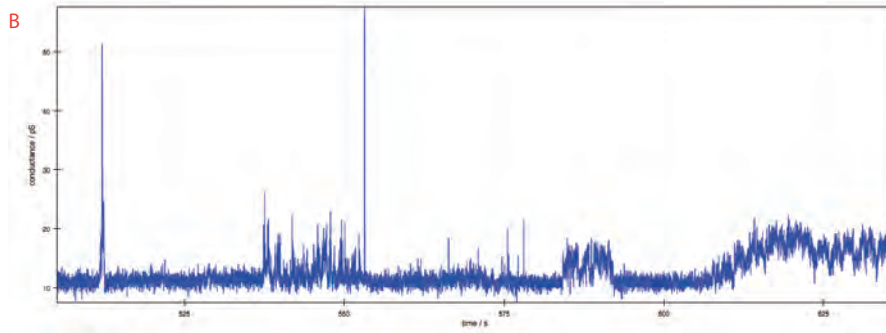
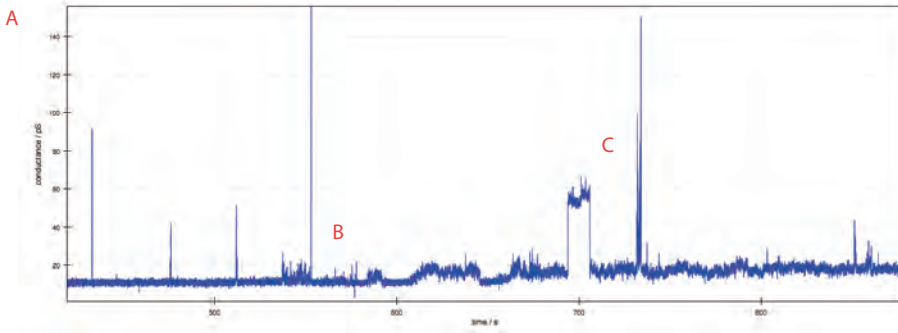
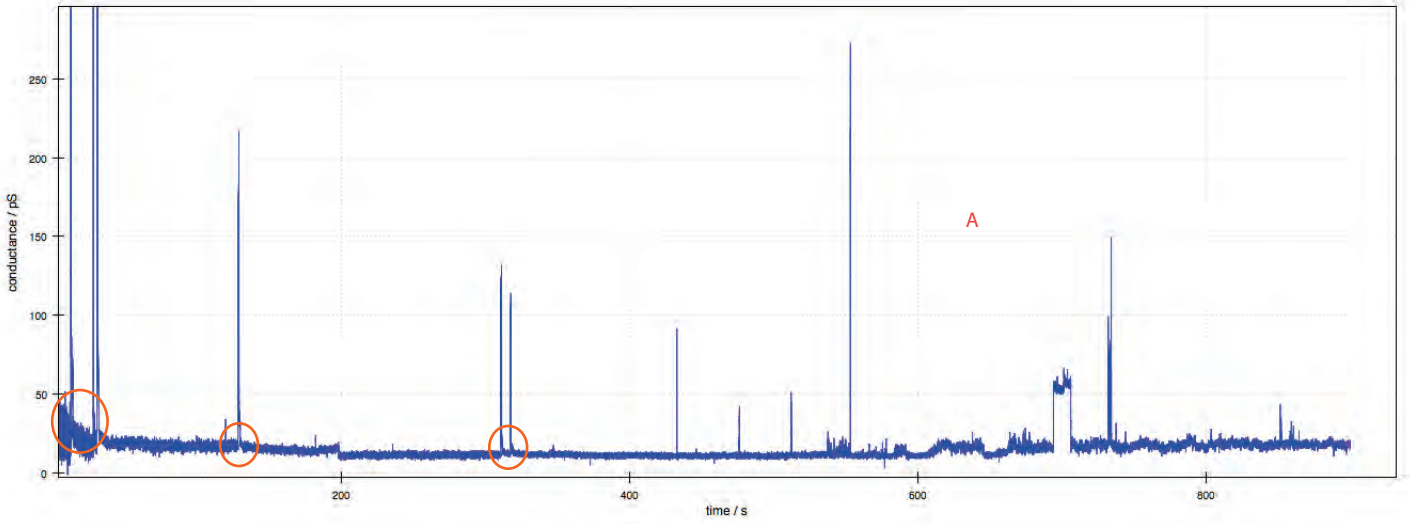


[JC-68] bCD-6-Am-F4 - 1M CsCl HEPES pH7 survey

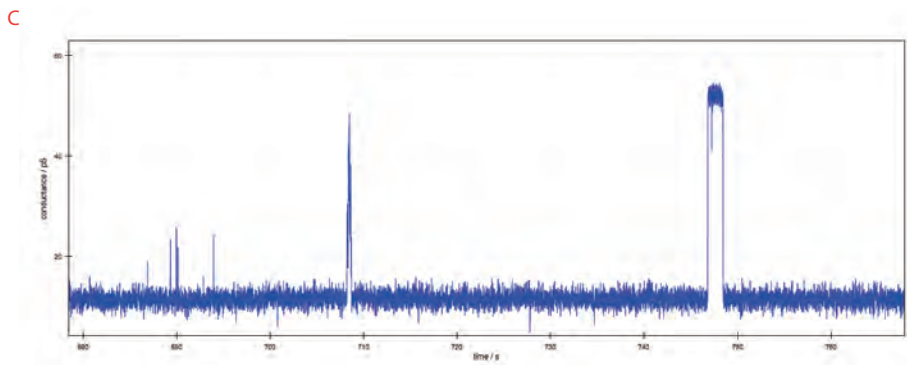
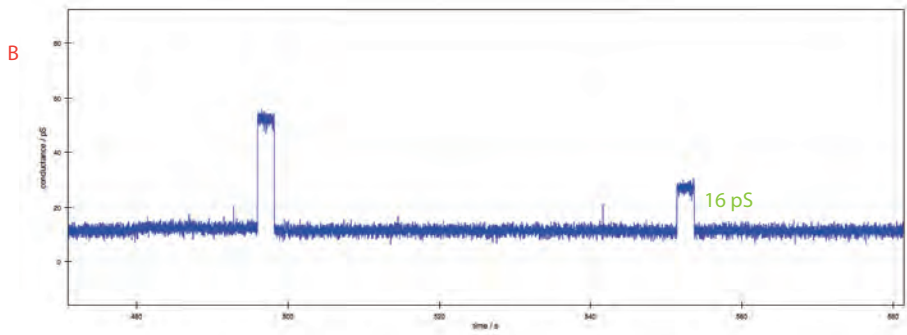
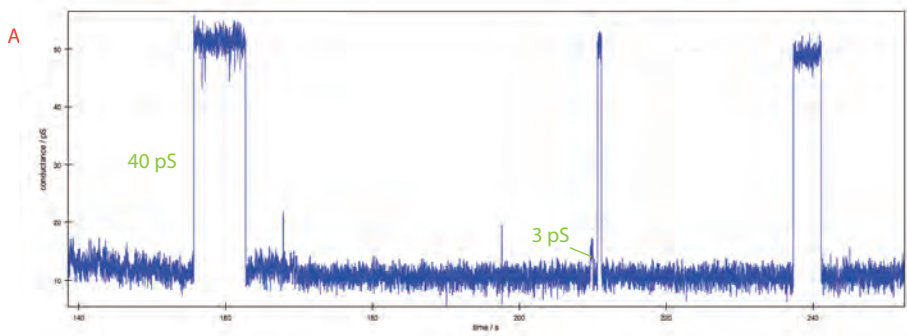
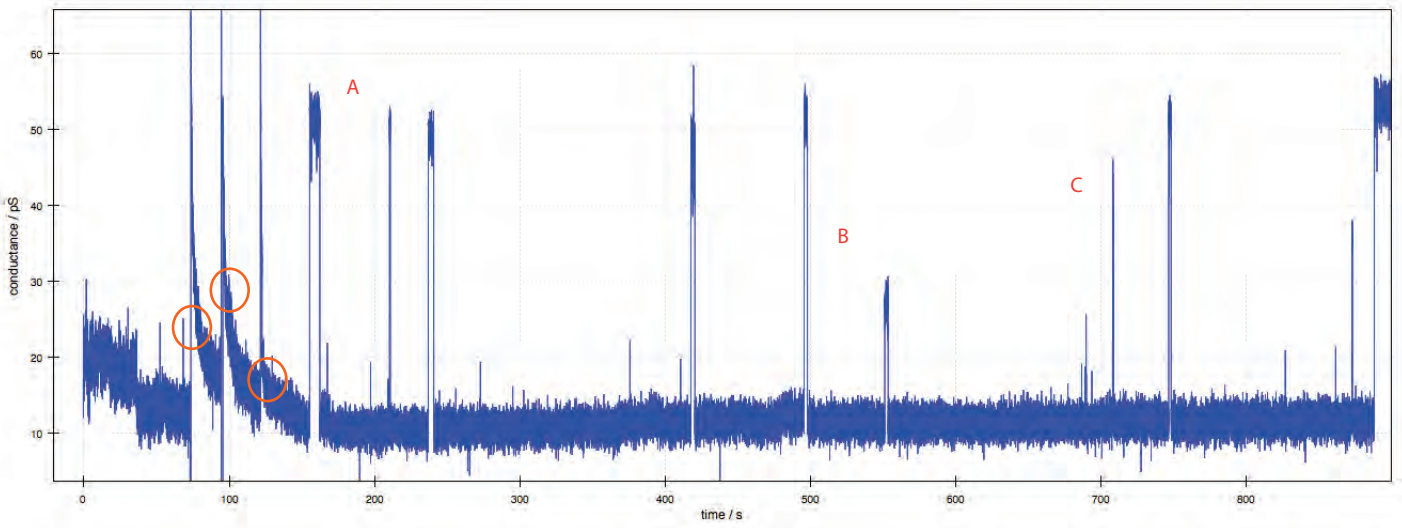


68-0001

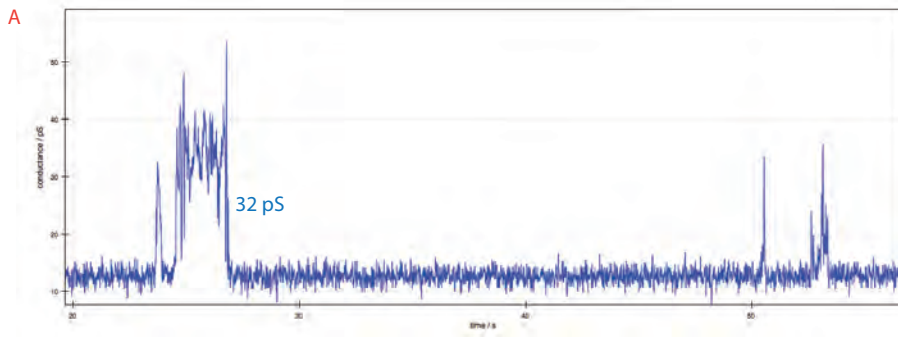
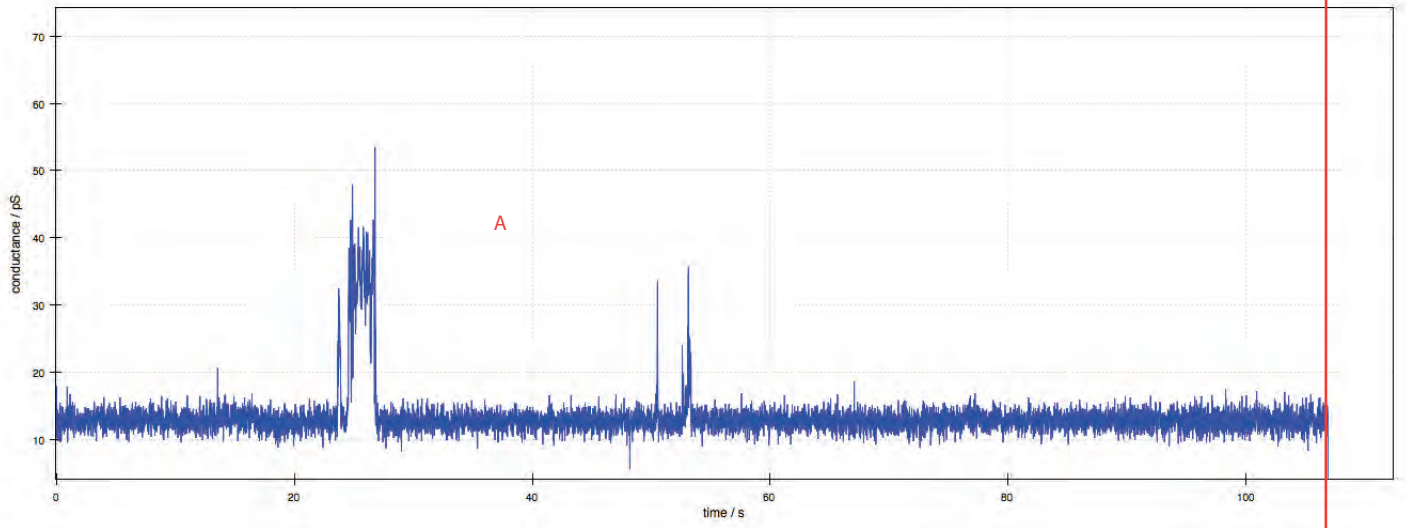


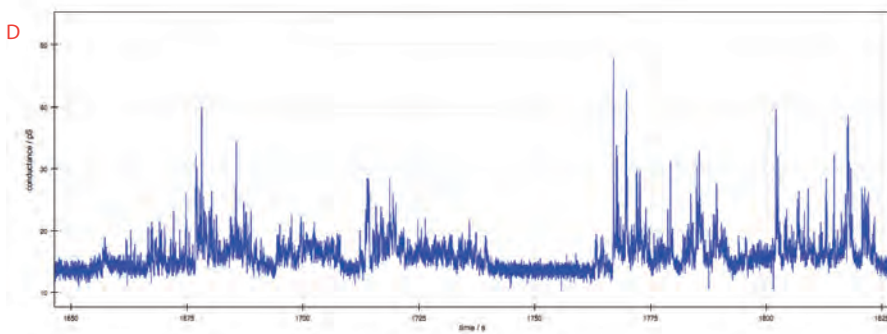
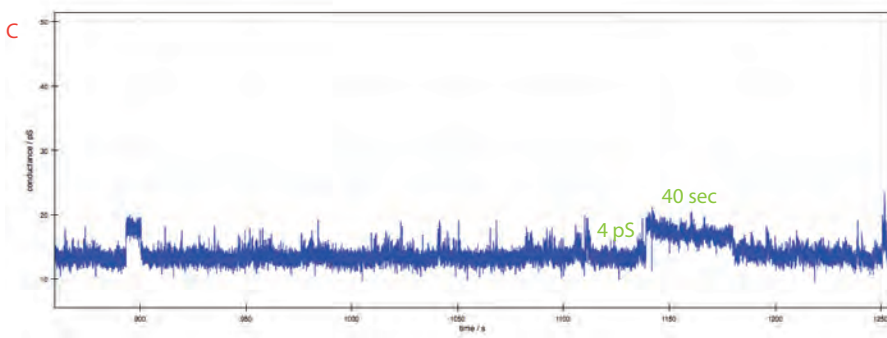
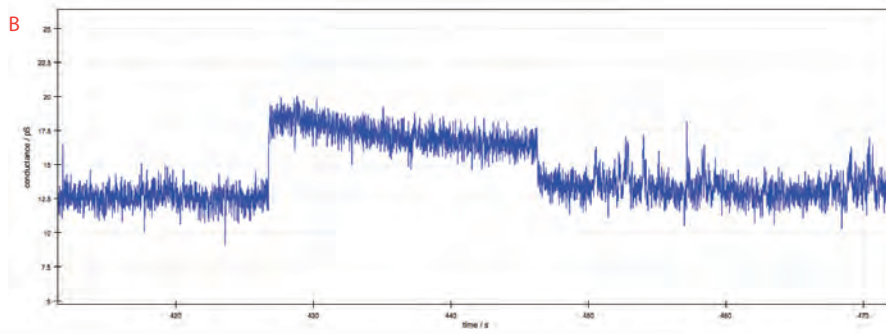
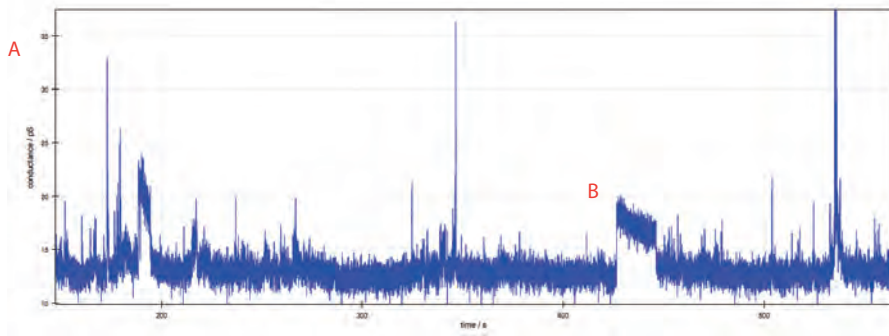
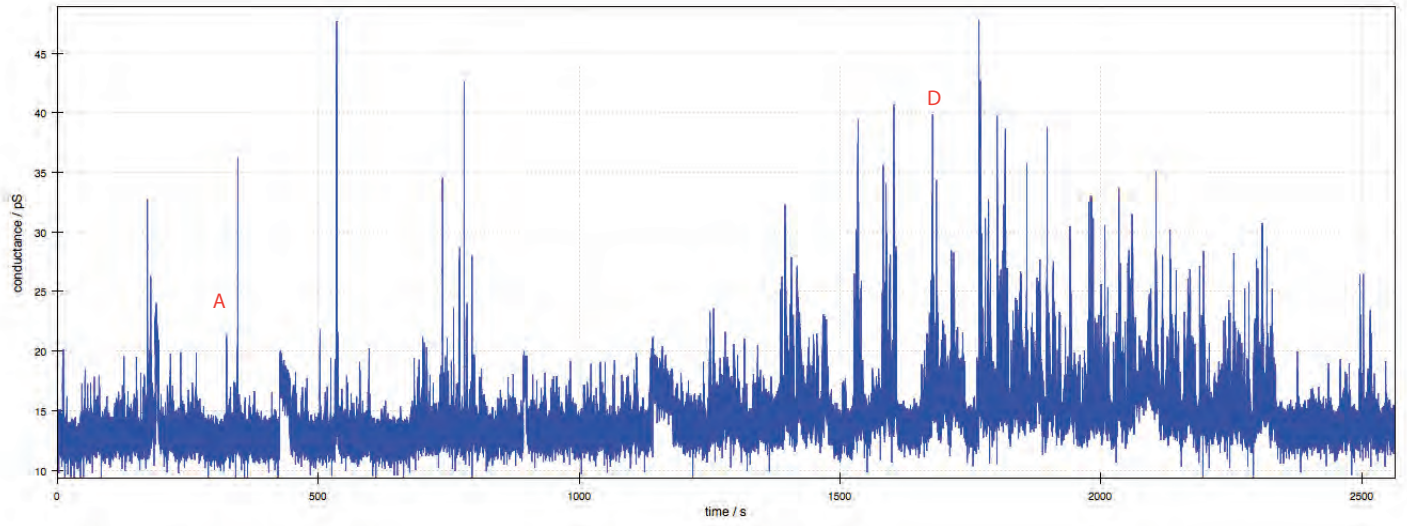


68-0003

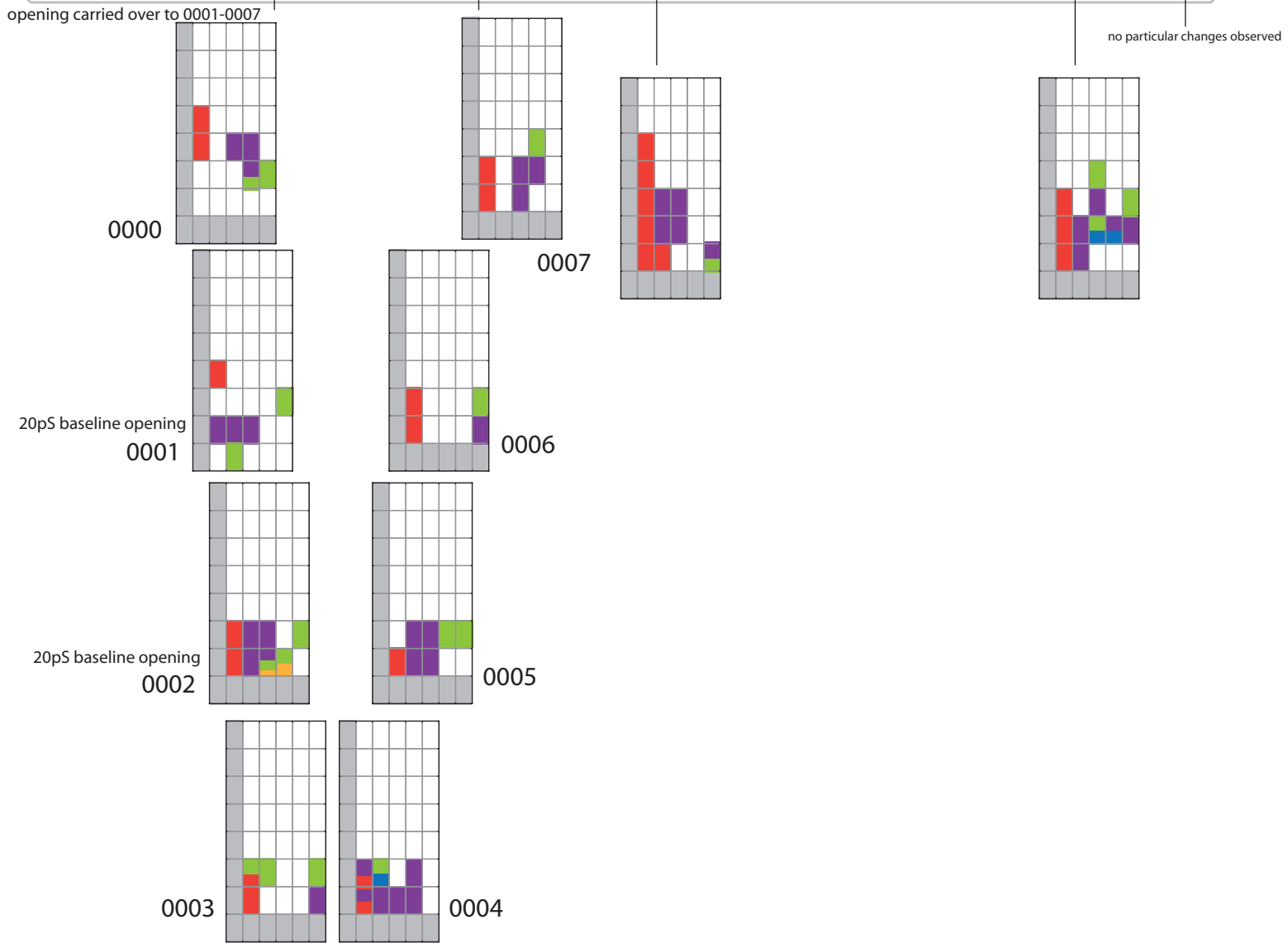
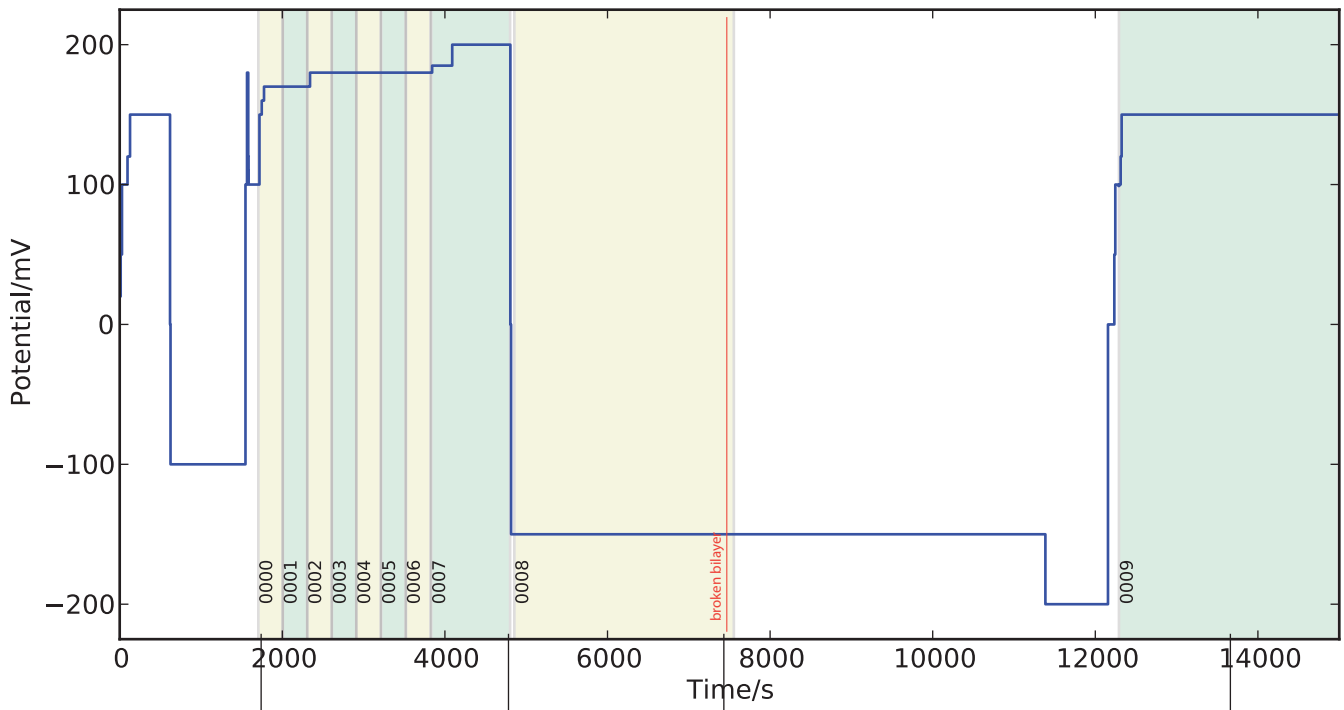


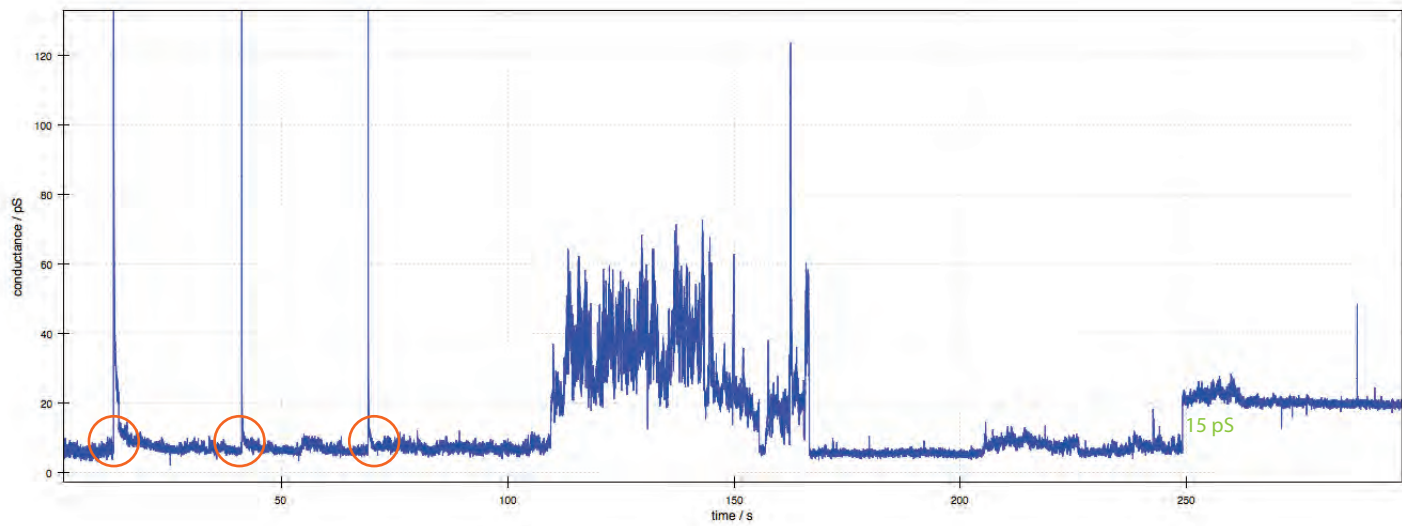
68-0004

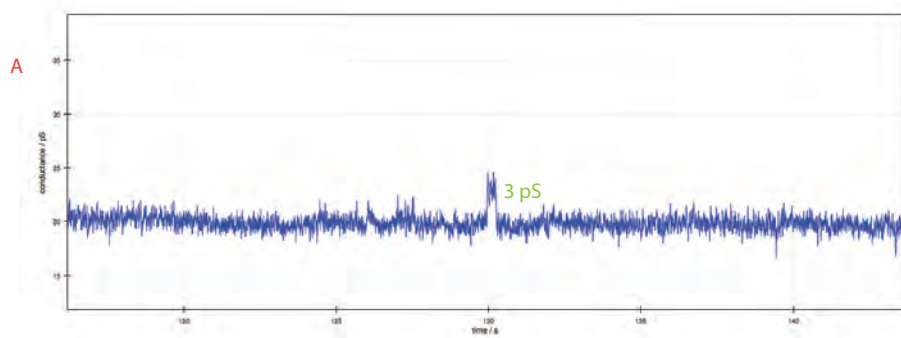
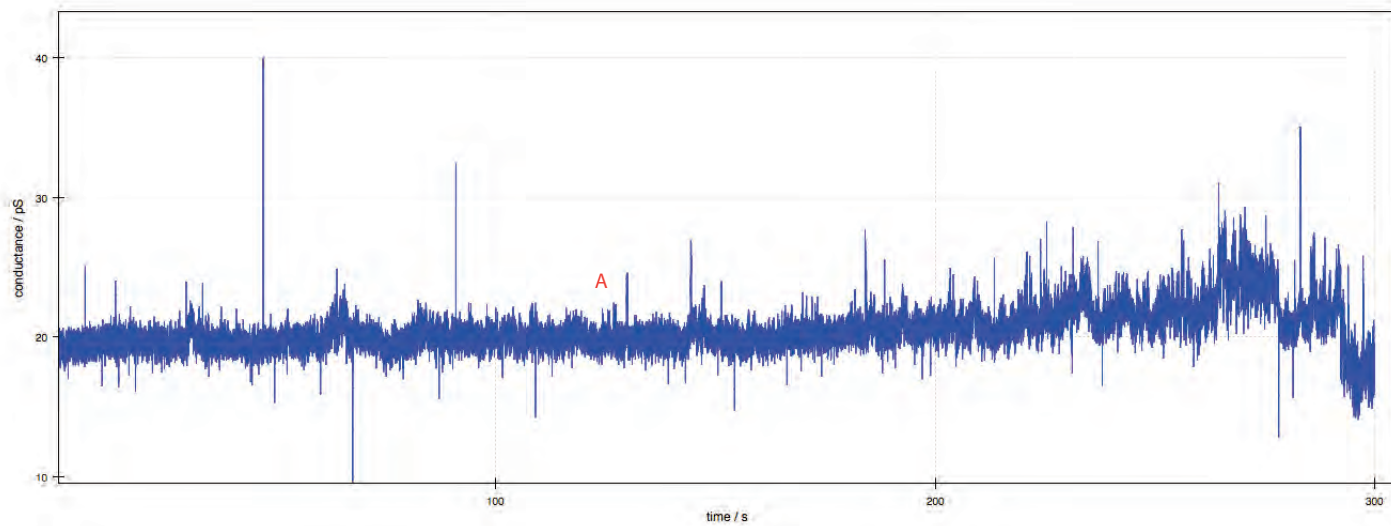


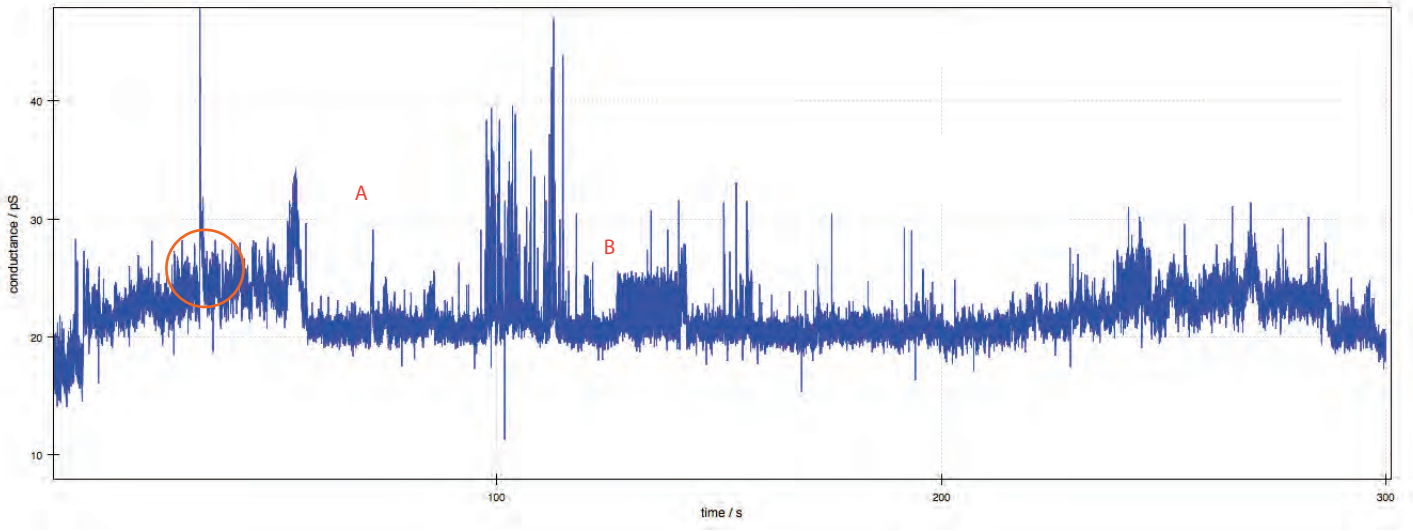


[JC-69] bCD-6-Am-F4 - 1M CsCl HEPES pH7 2moleperc survey

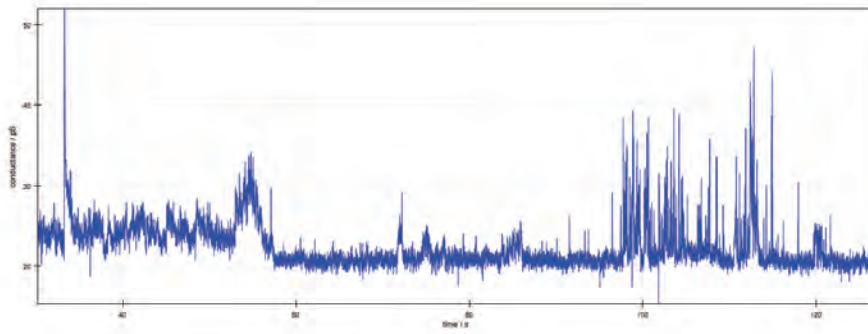




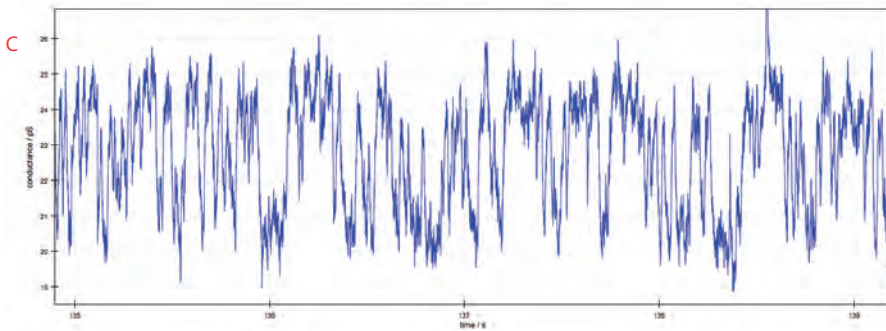
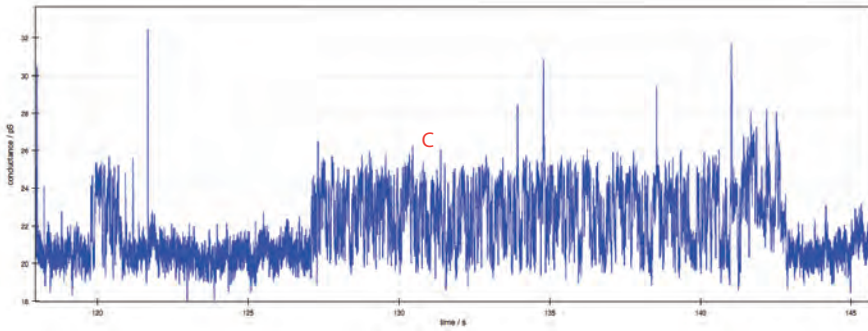


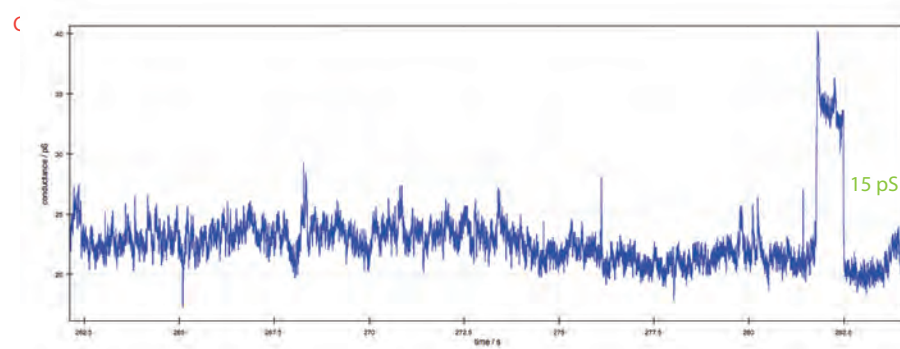
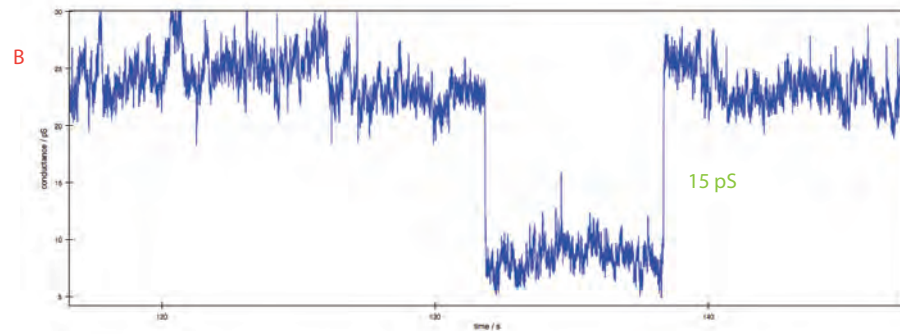
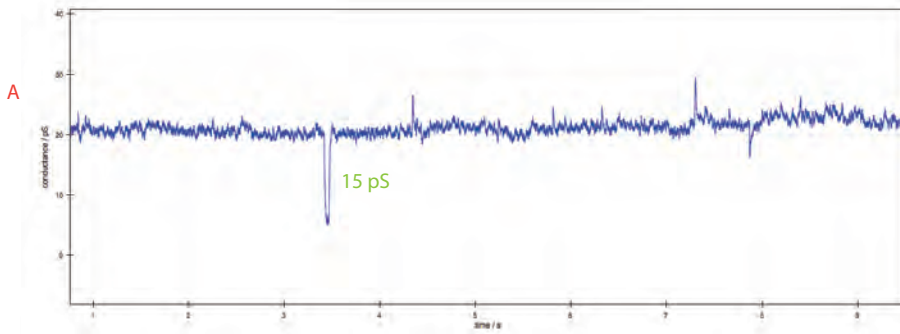
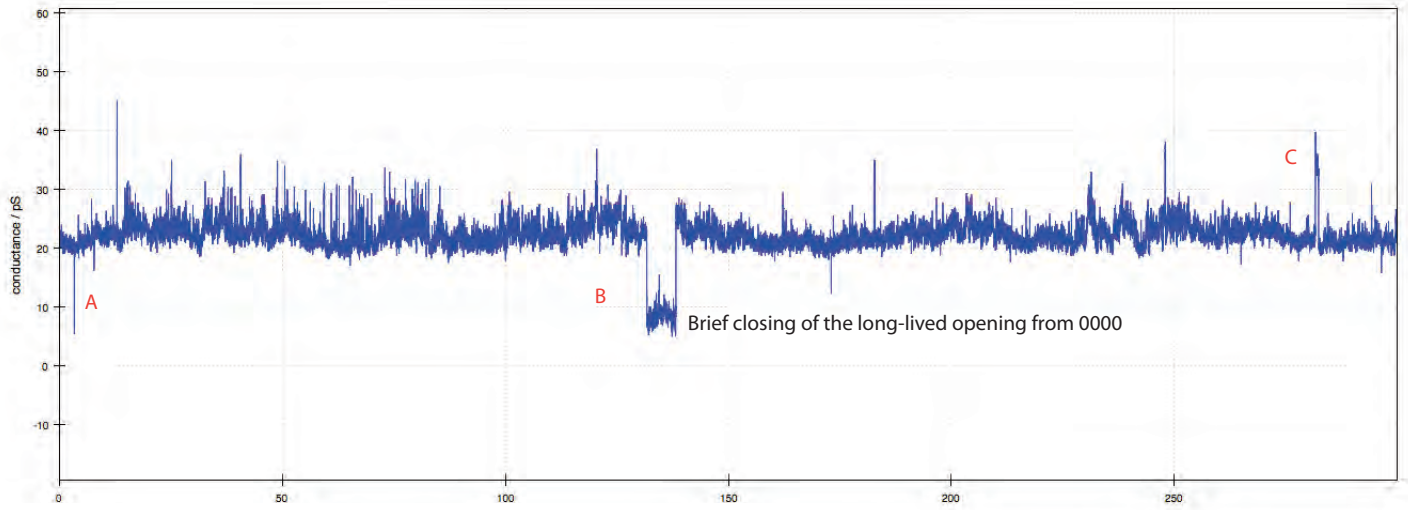


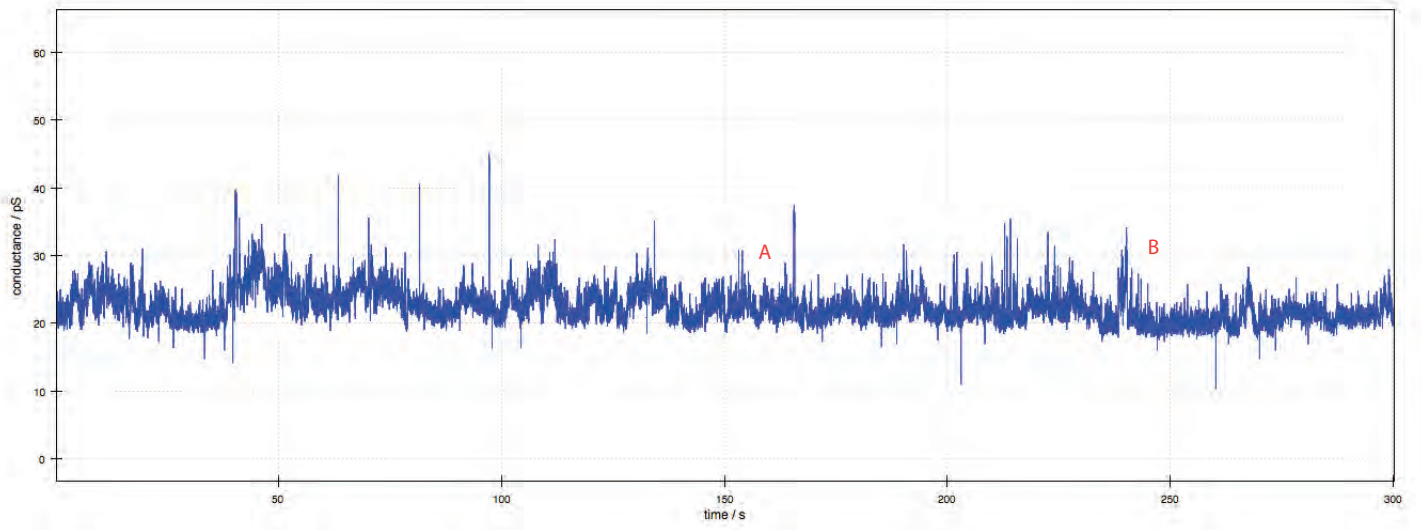
A



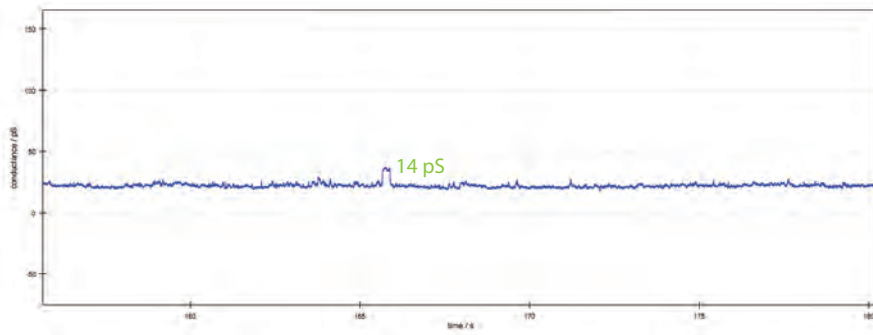
B



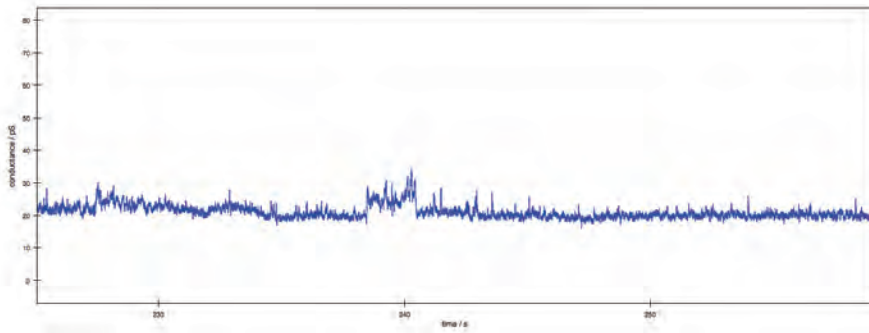


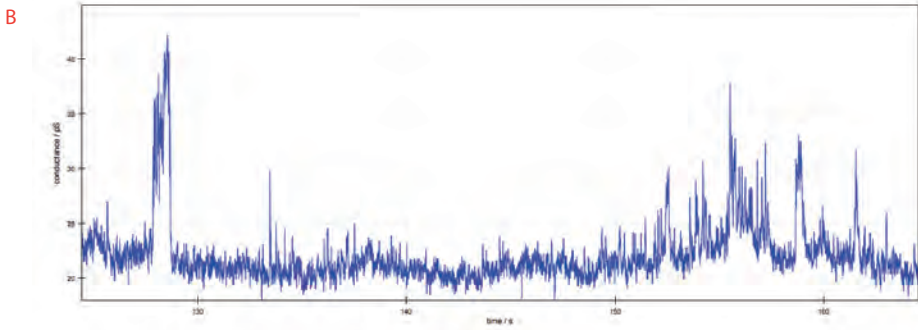
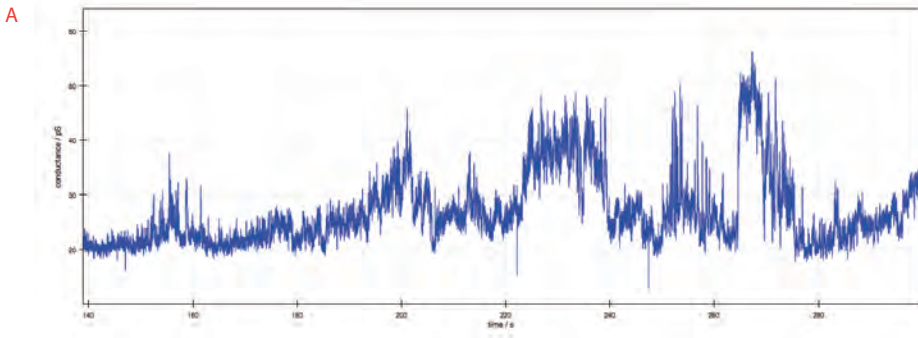
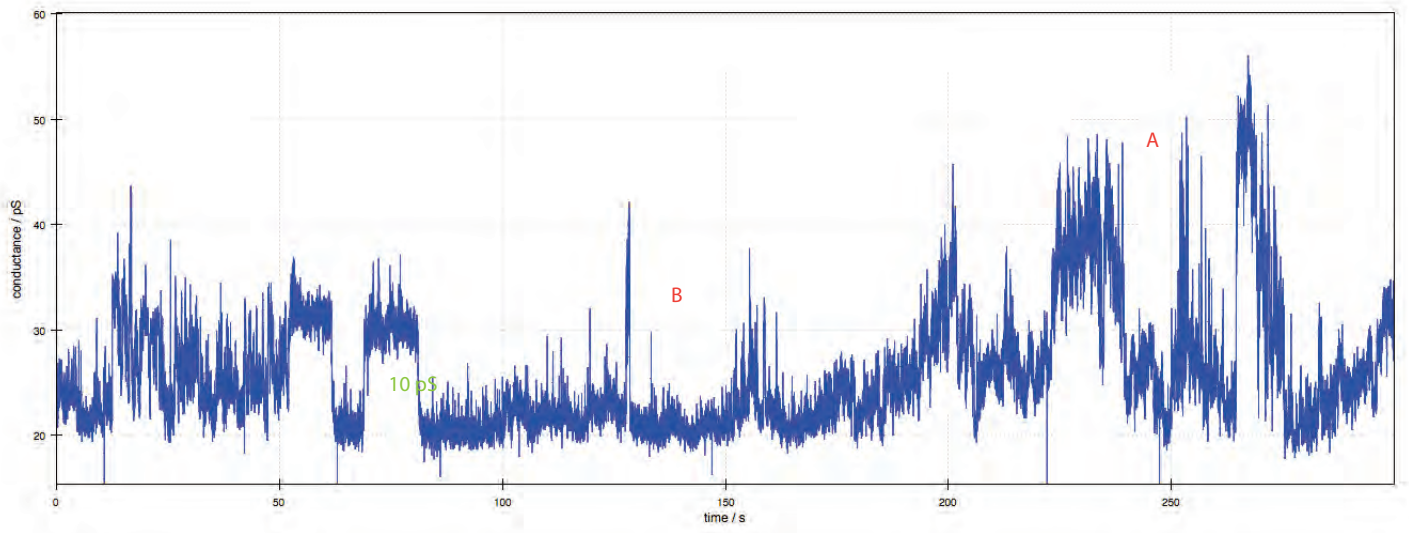


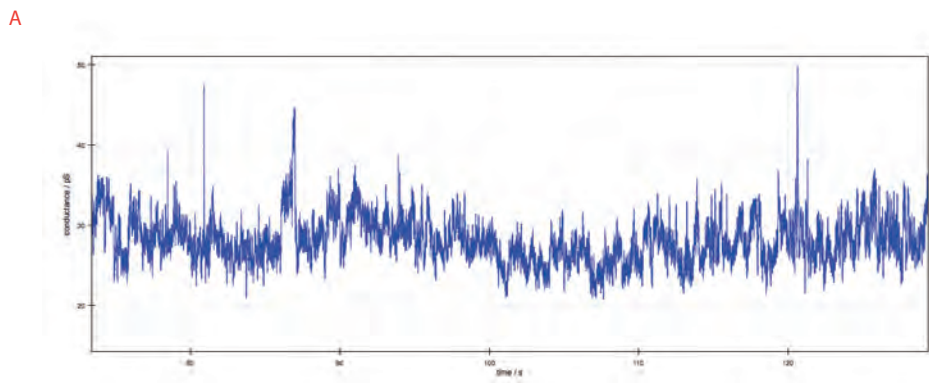
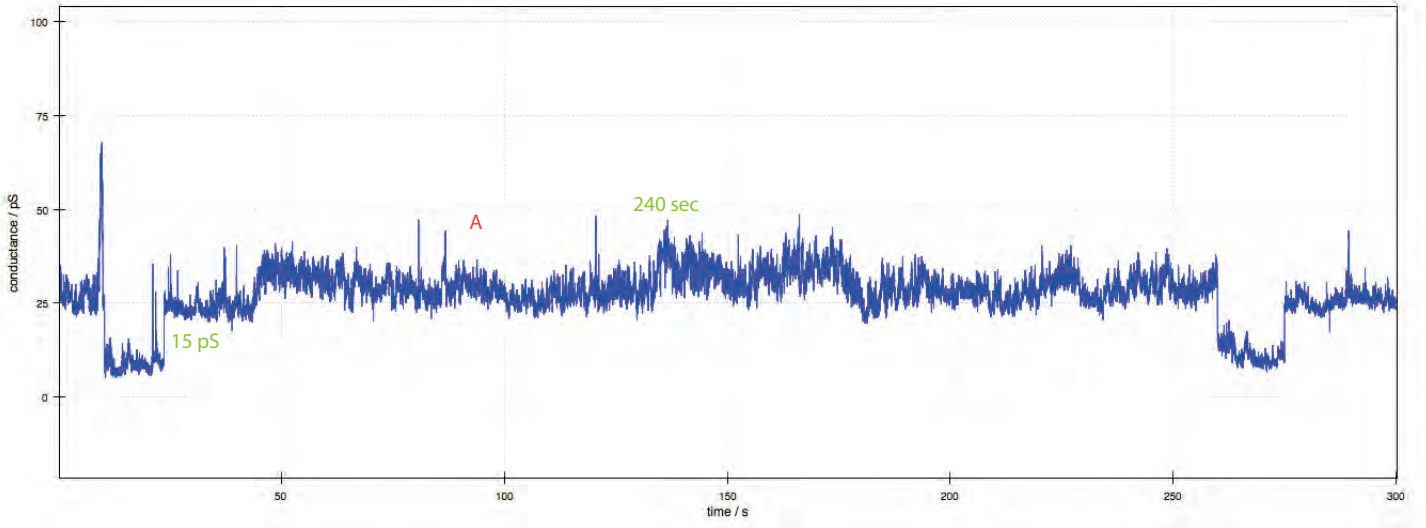
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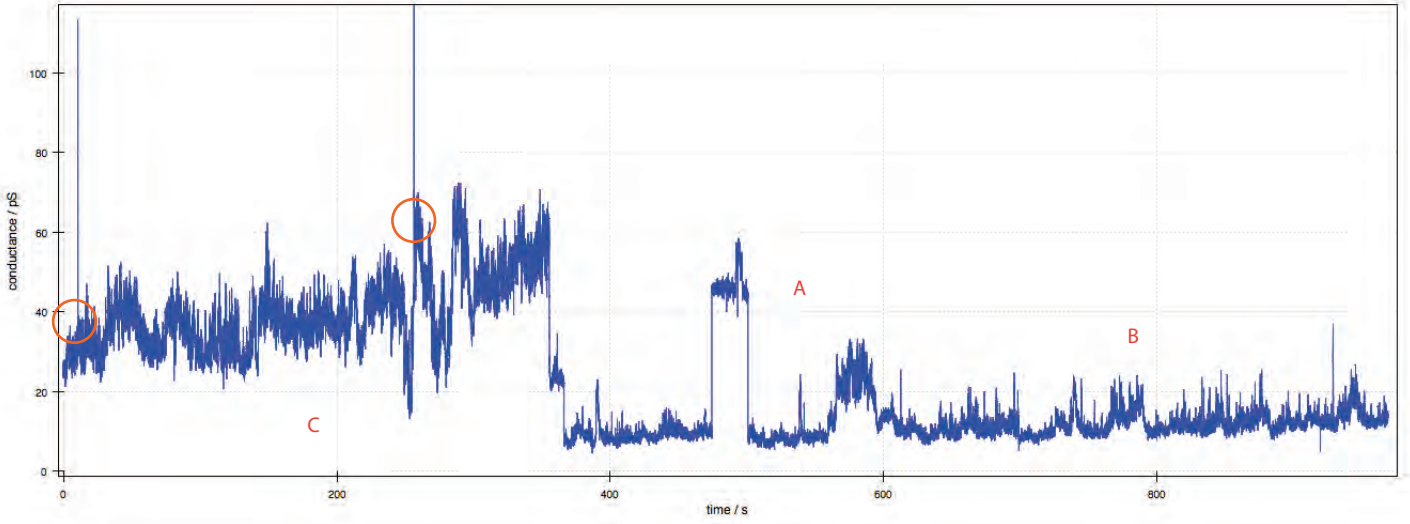


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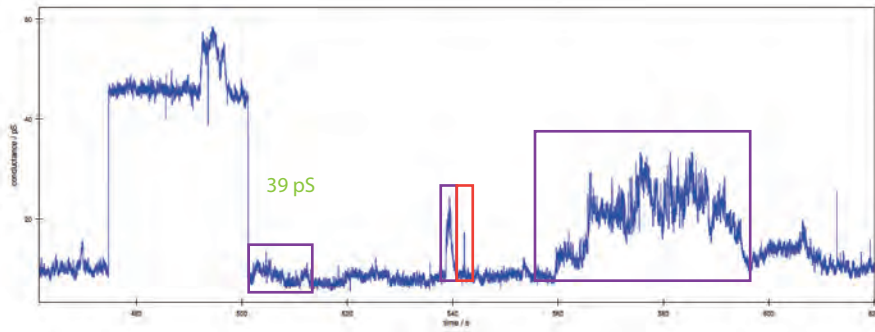




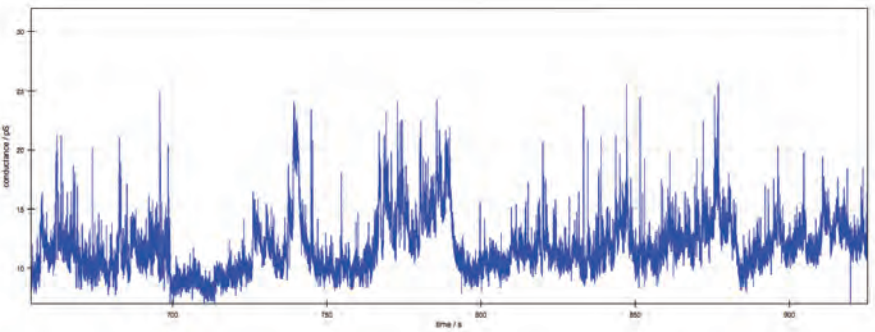


26 sec

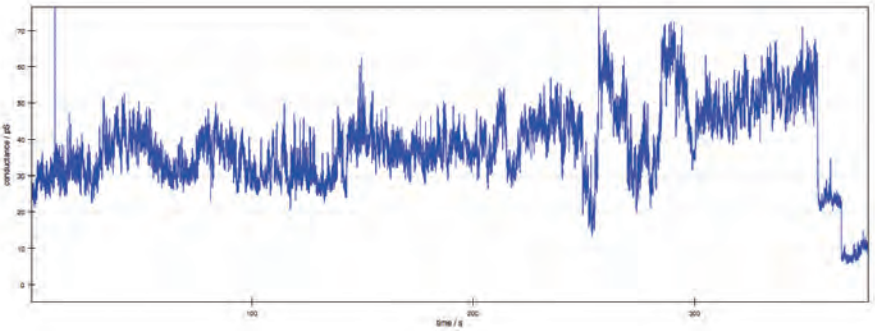
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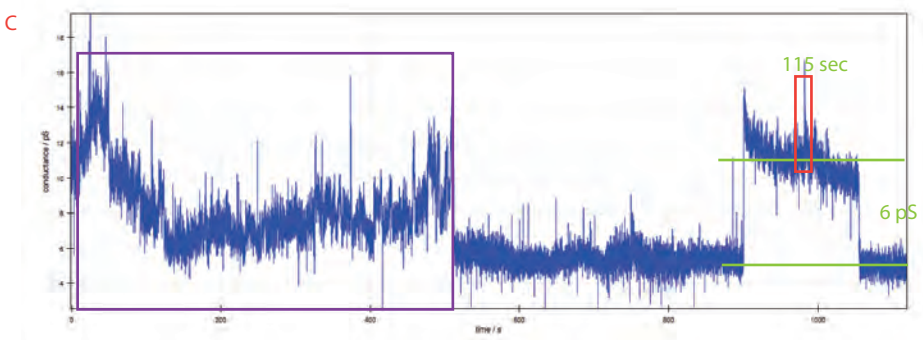
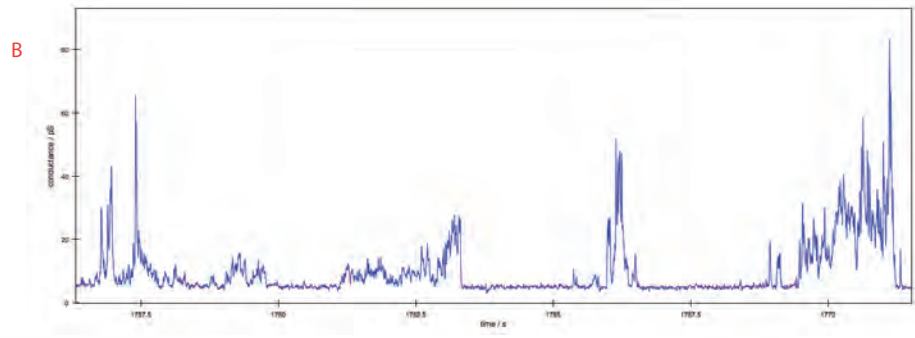
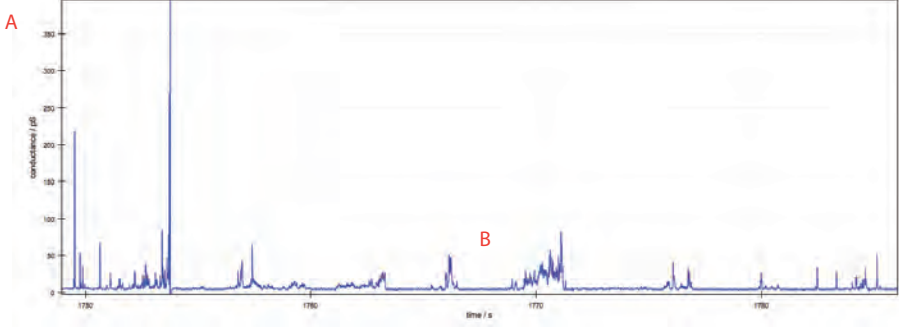
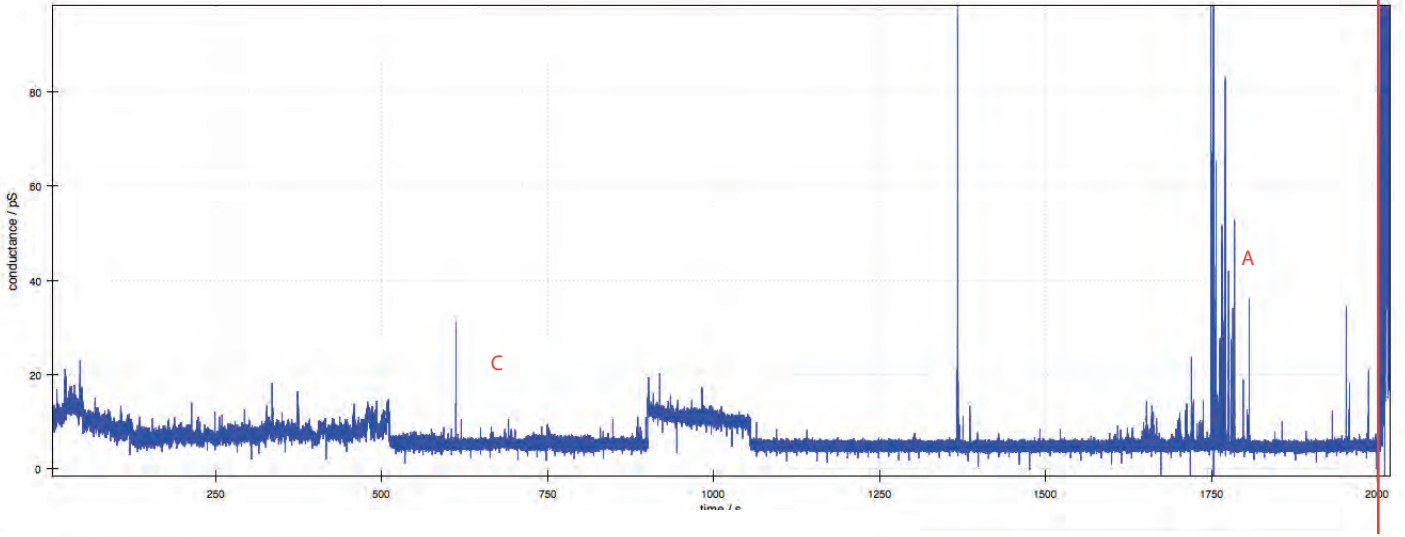


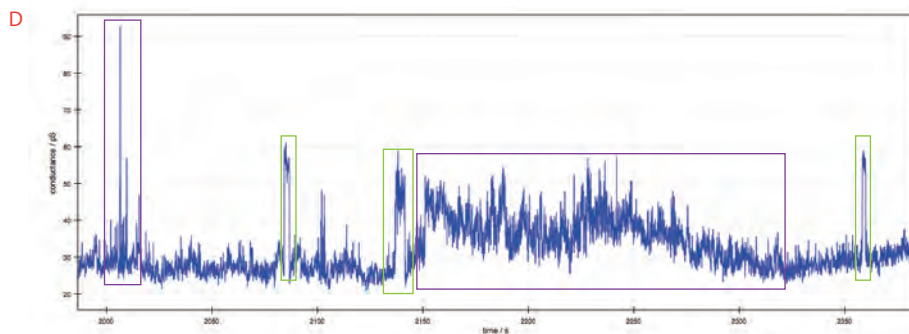
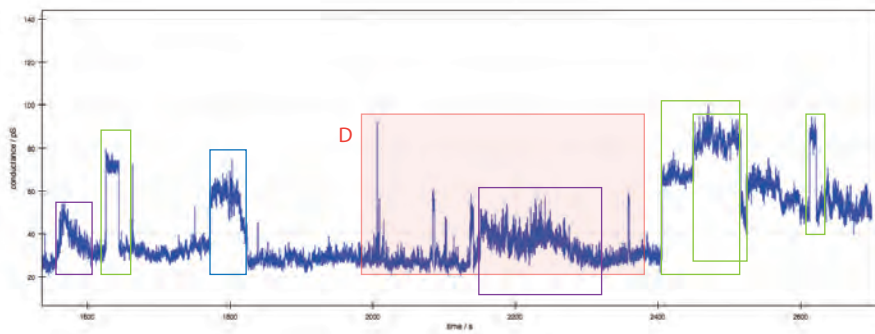
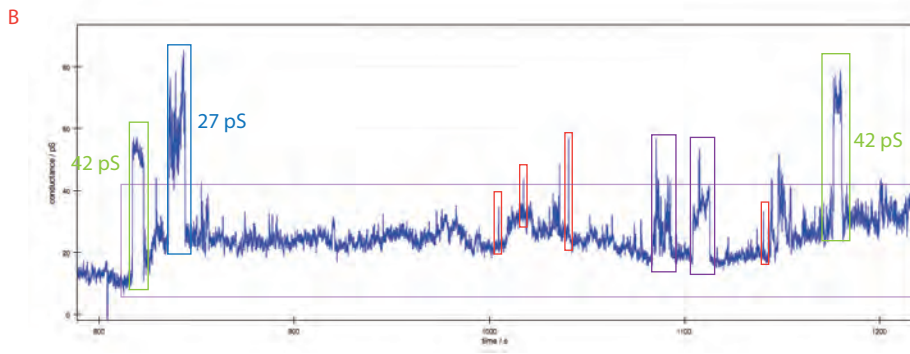
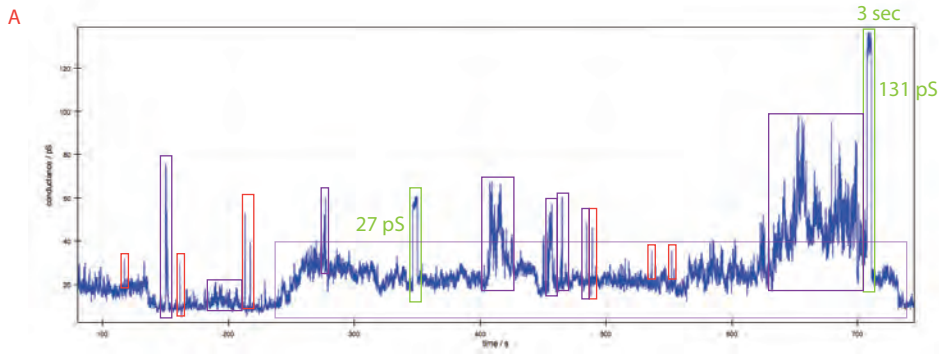
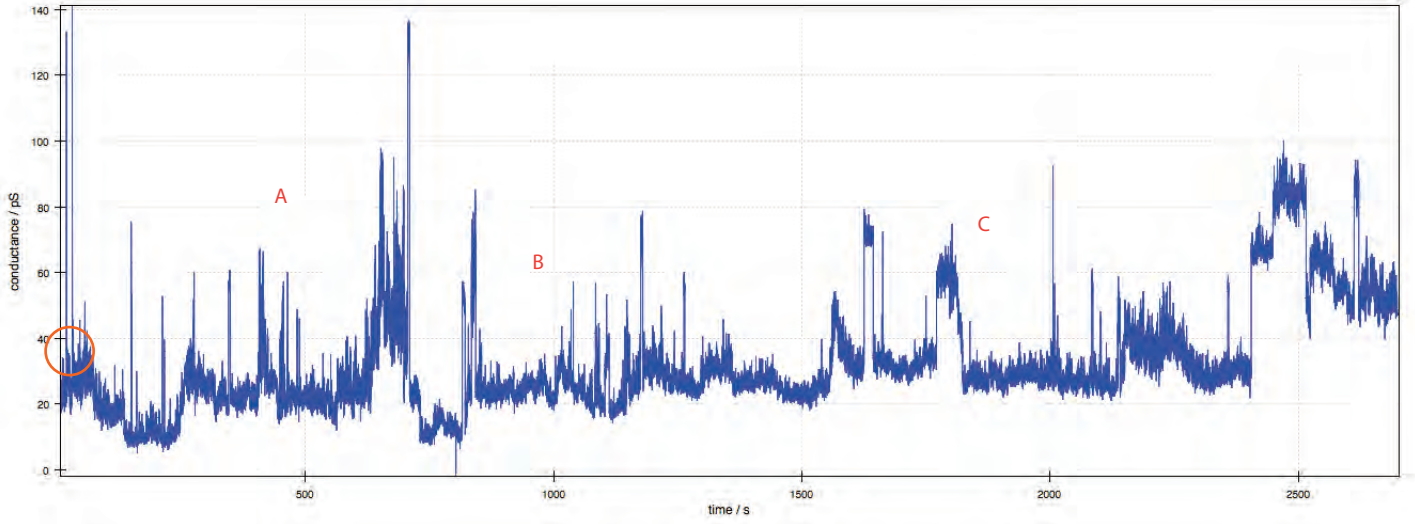
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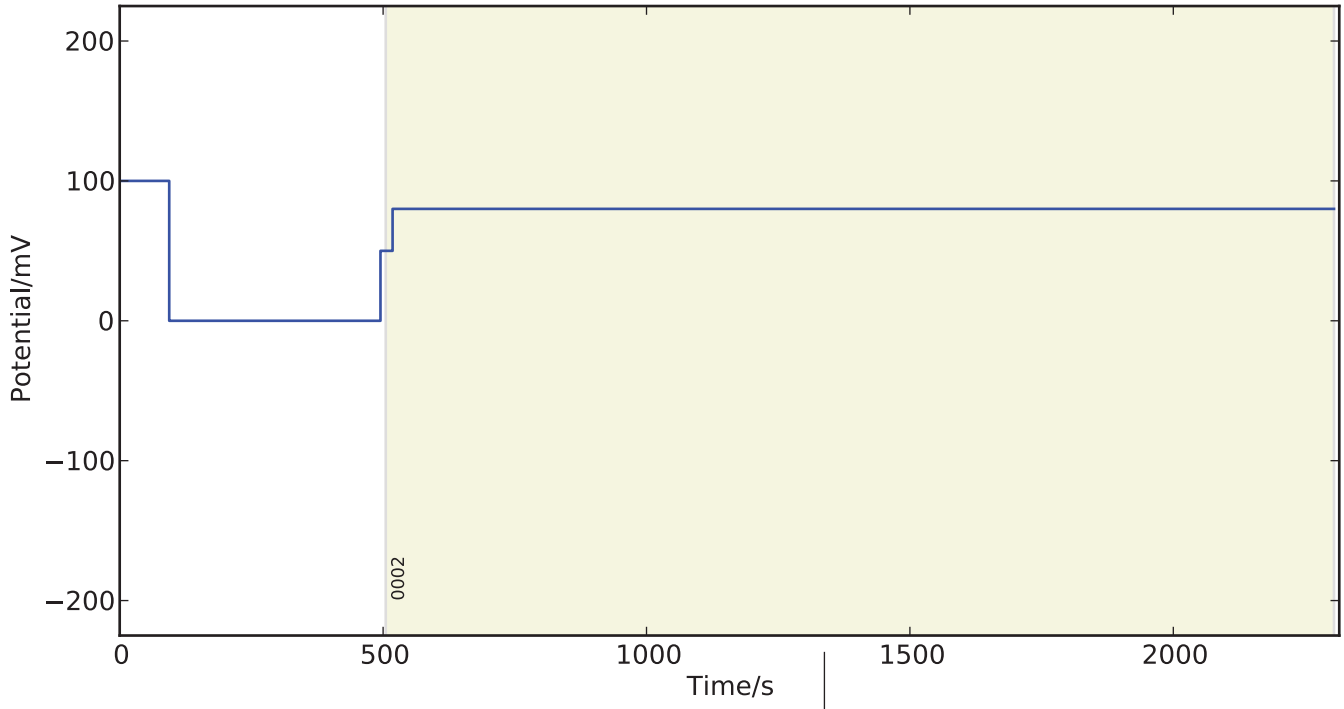
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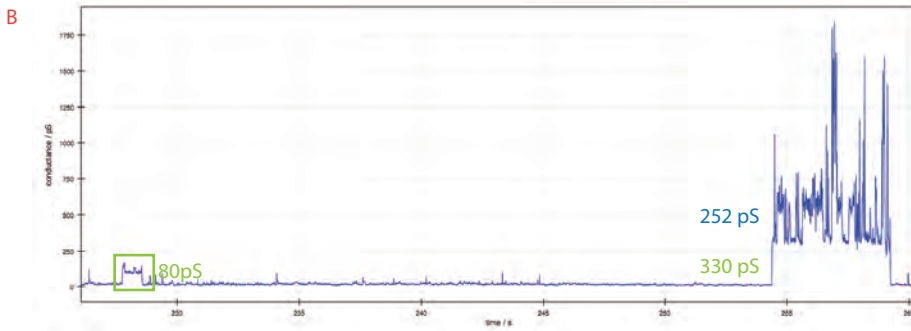
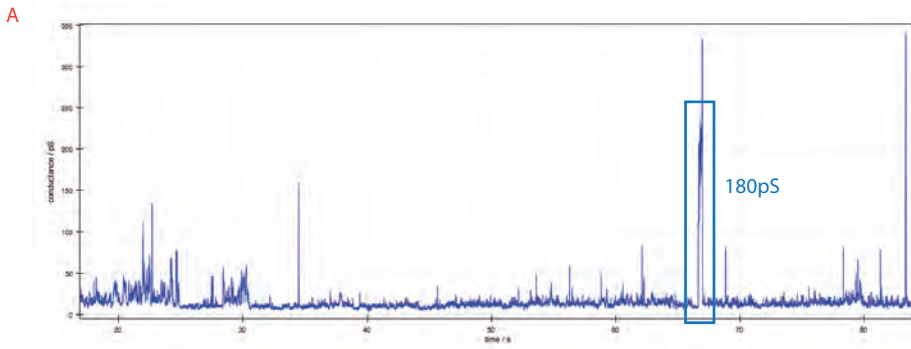
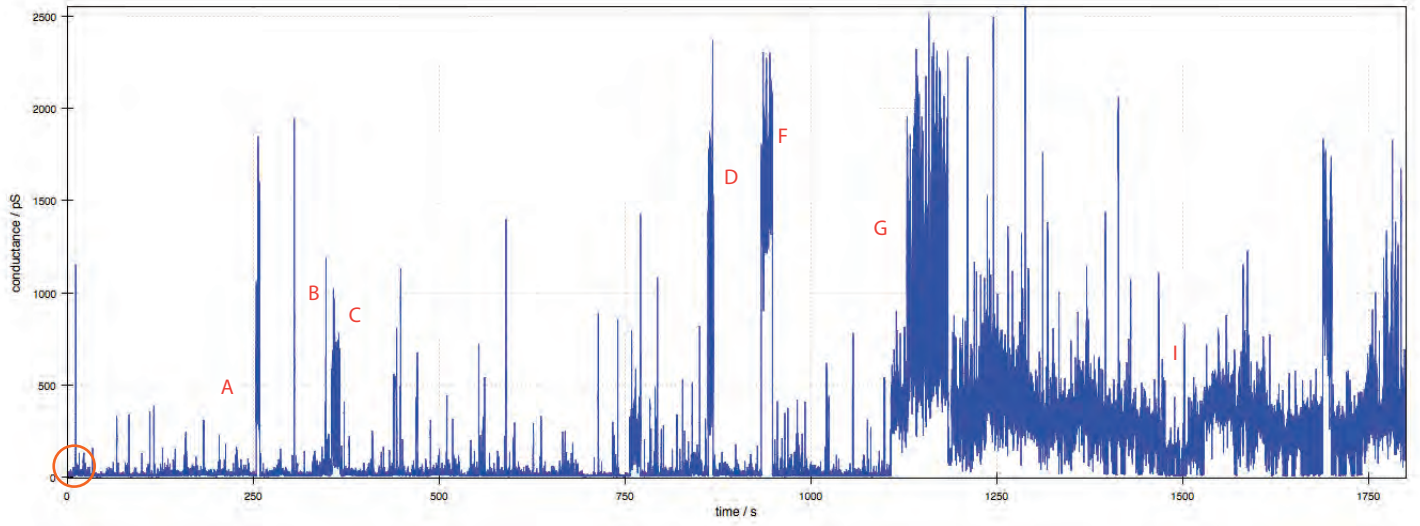




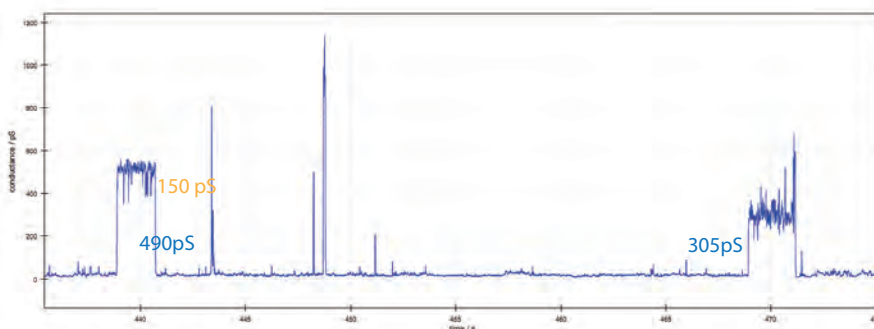
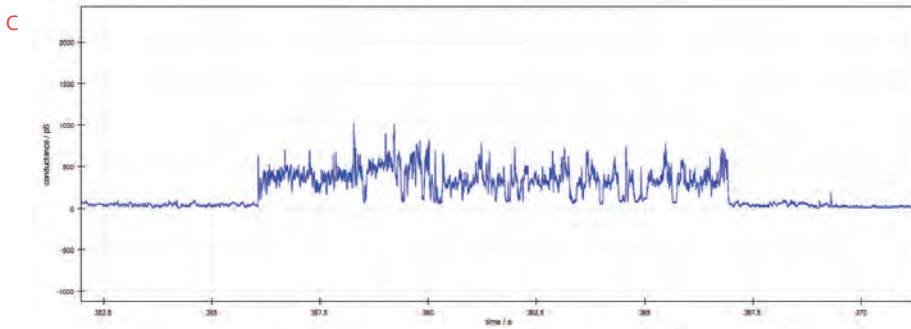


[JC-81] bCD6AmF4 1M CsCl pH 7 homoAdd

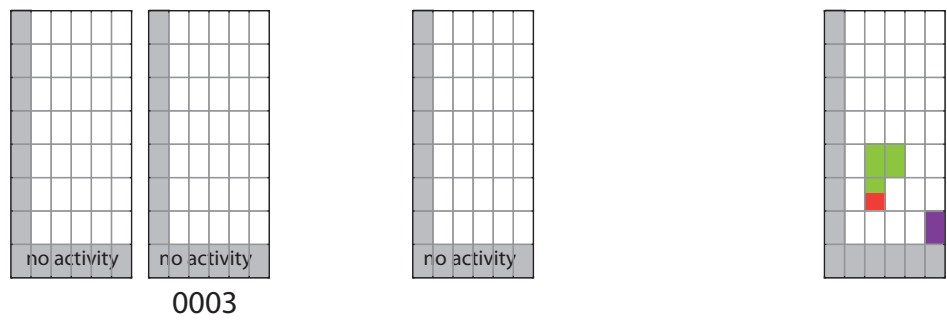
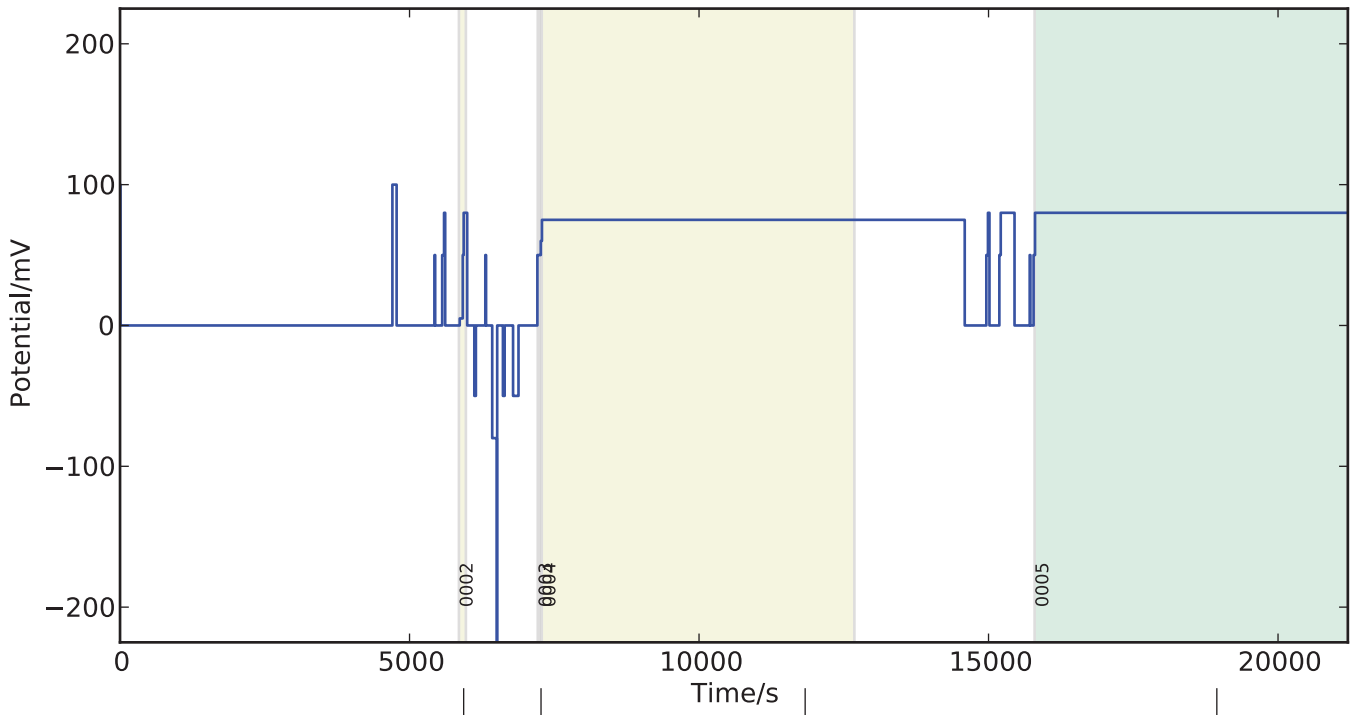




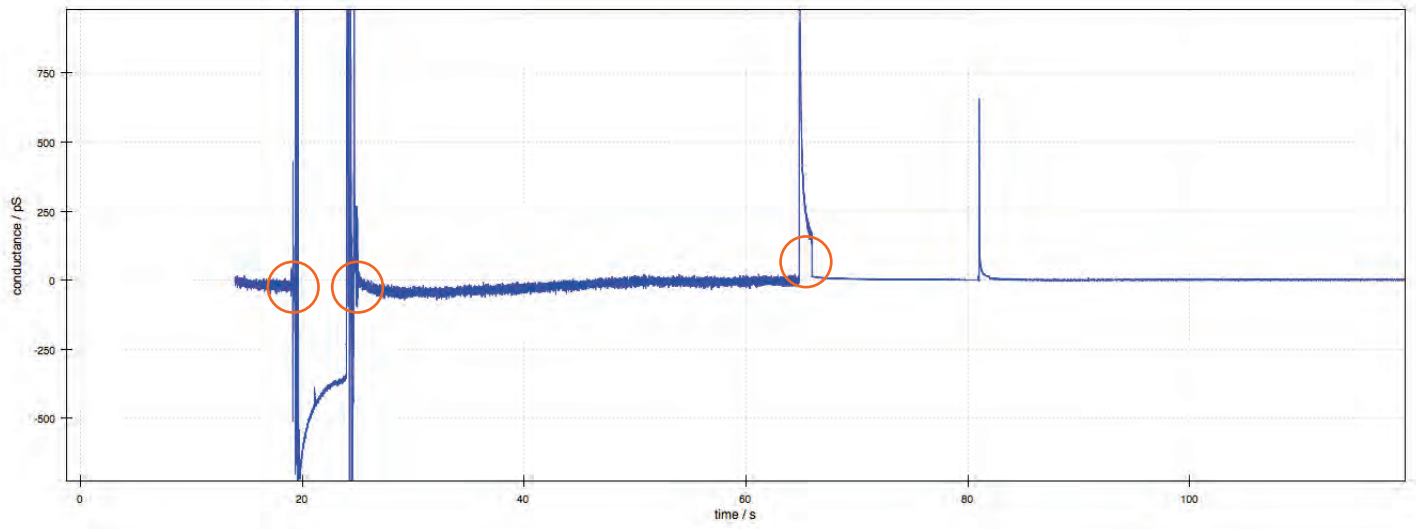
See separate discussion on "assignment"



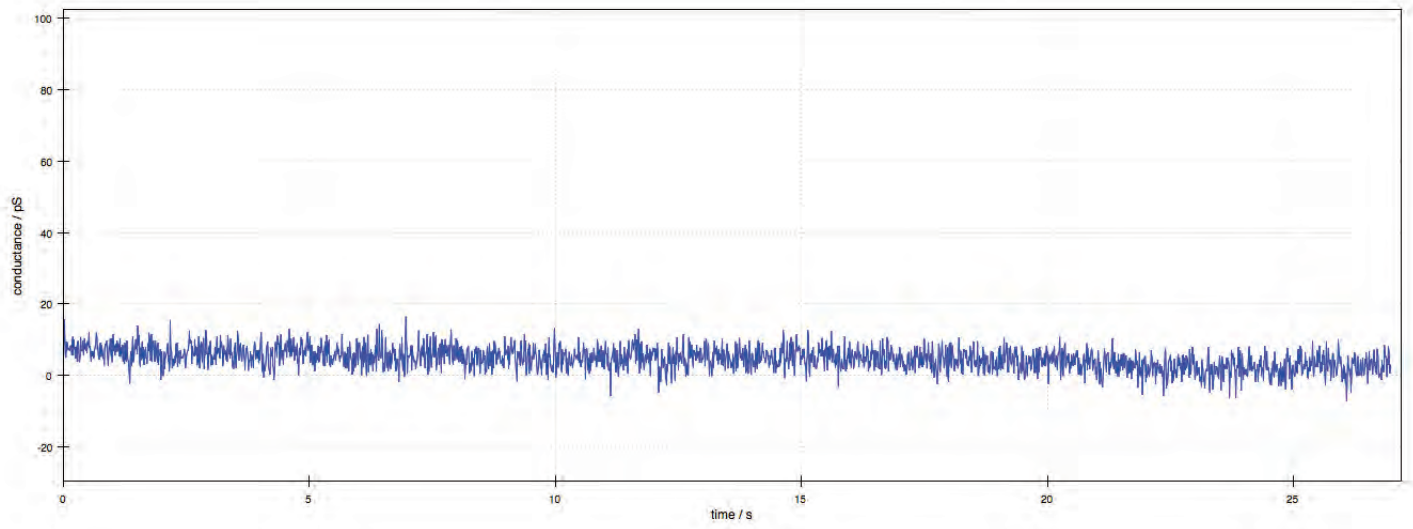
[JC-85] bCD6AmF4 1M CsCl pH 7 homoAdd (4)



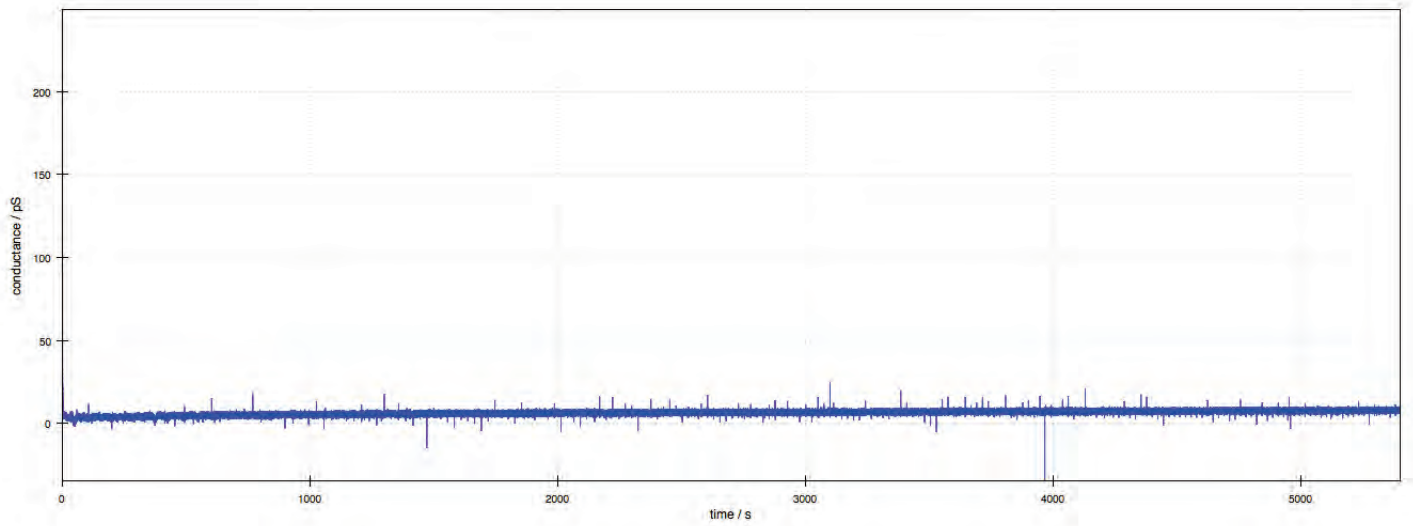
85-0002

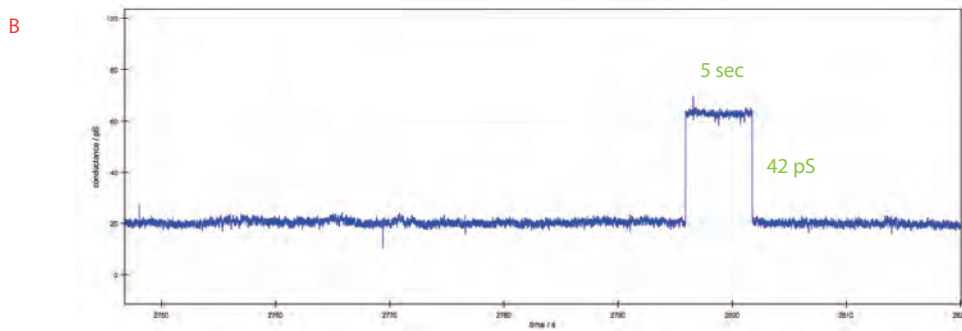
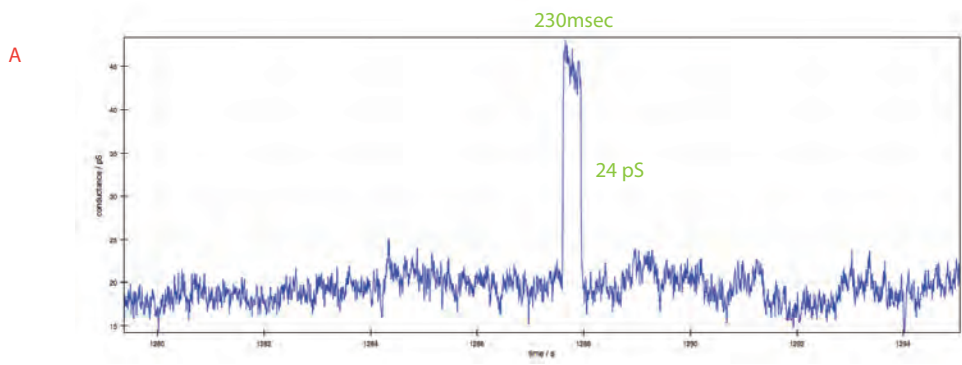
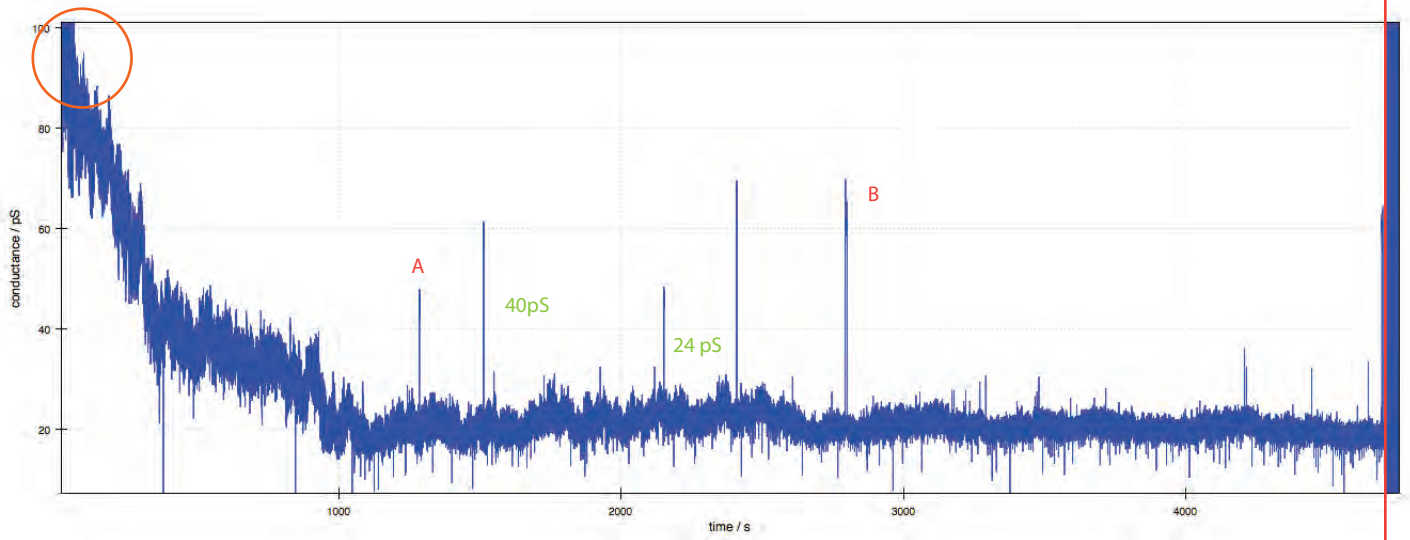


85-0003

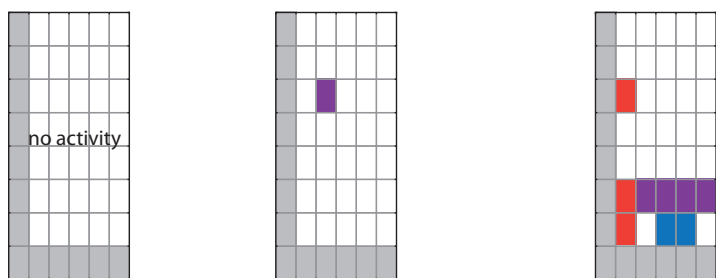
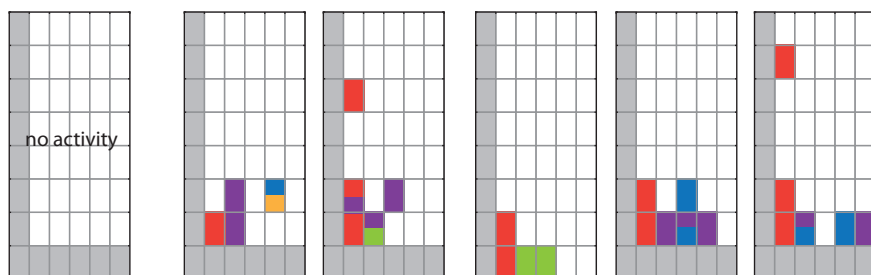
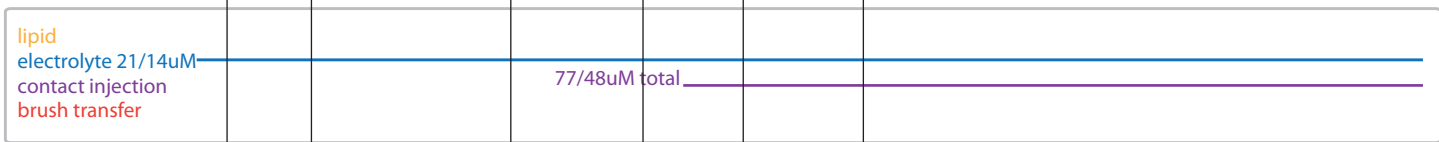
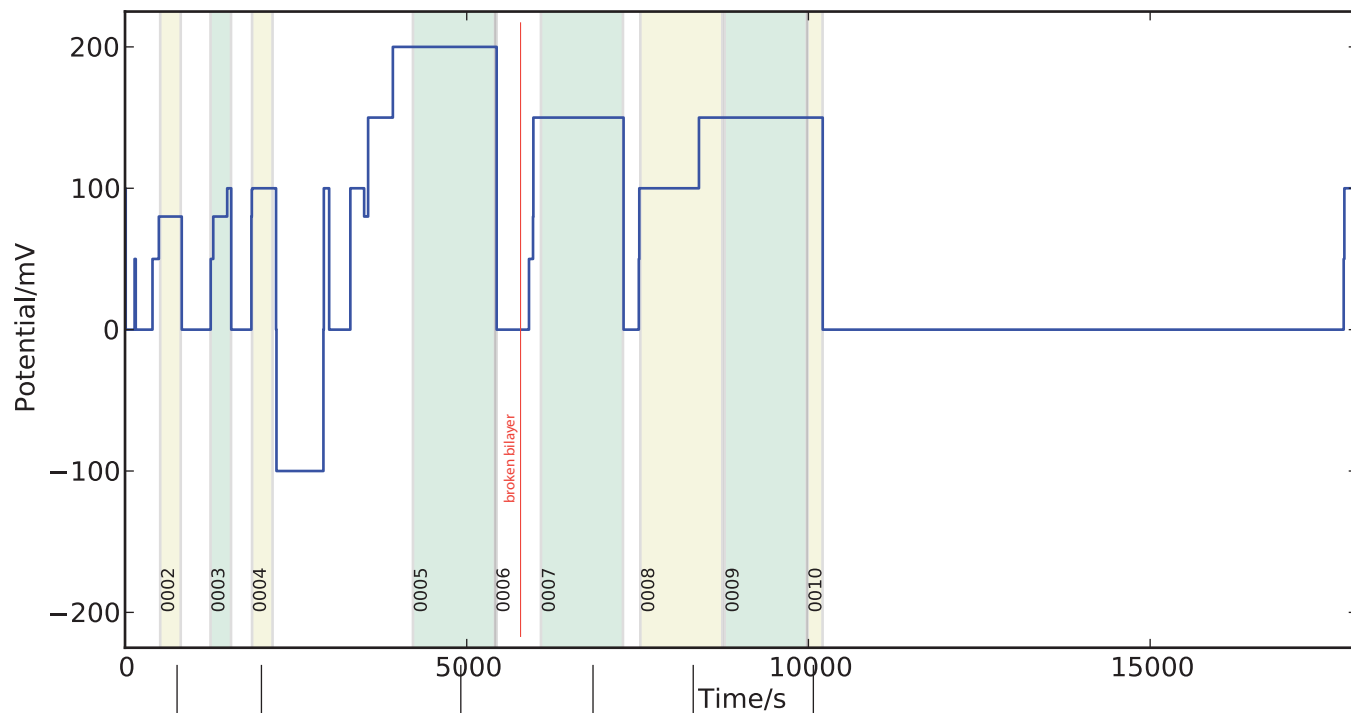


85-0004





[JC-87] bCD6AmF4 1M CsCl pH 7 homoAdd (5-newDiPhPC)

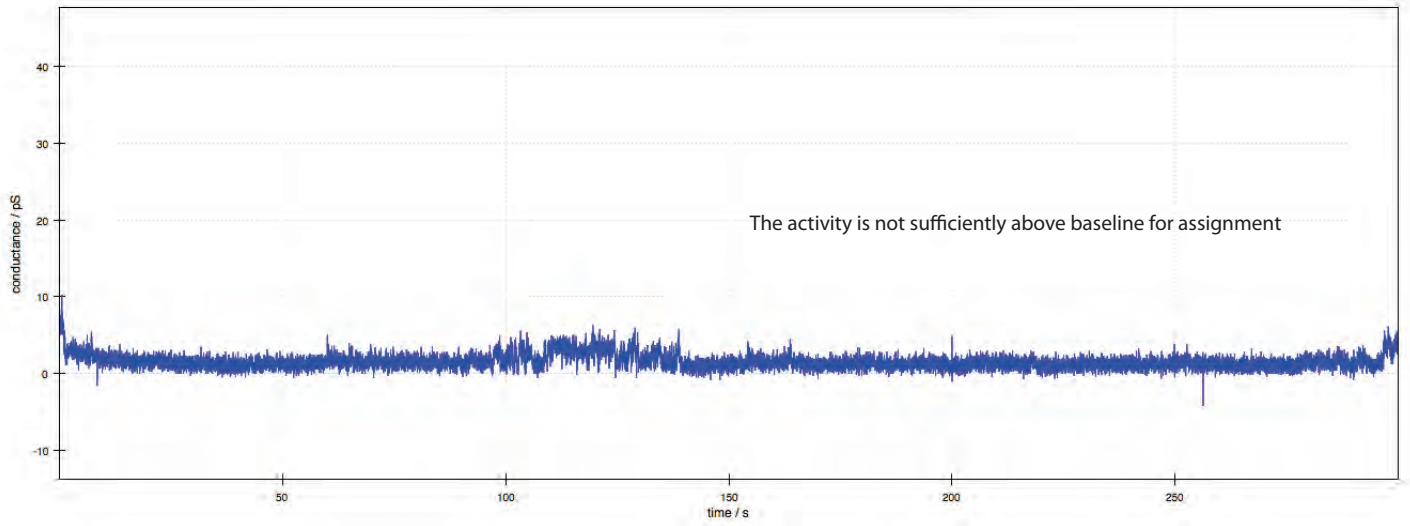


0003

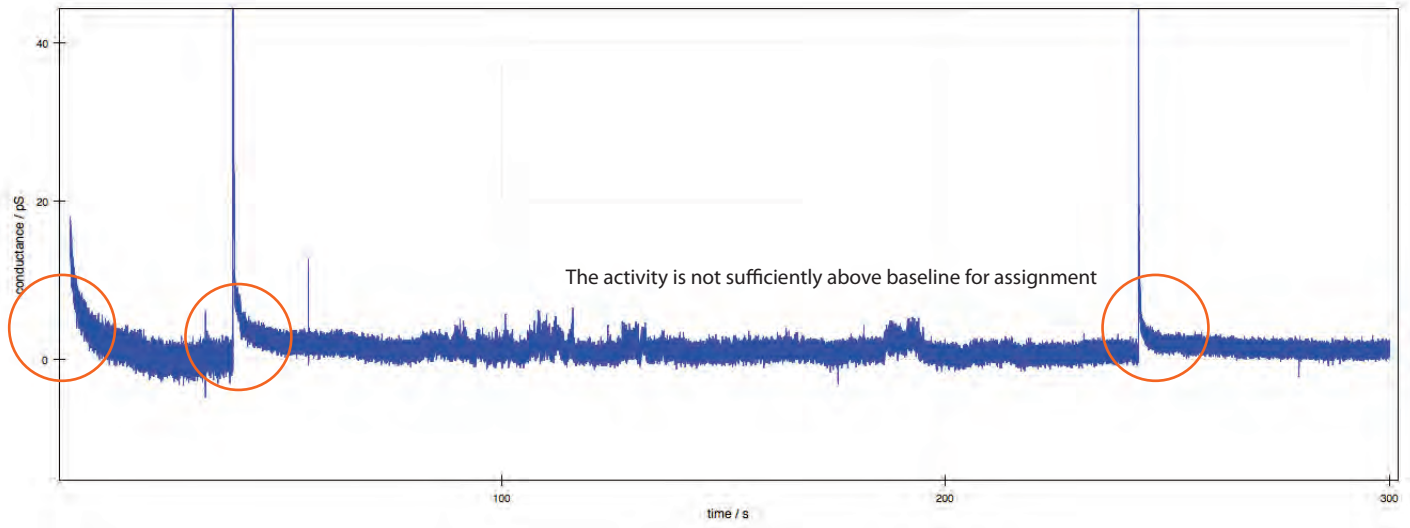
0006

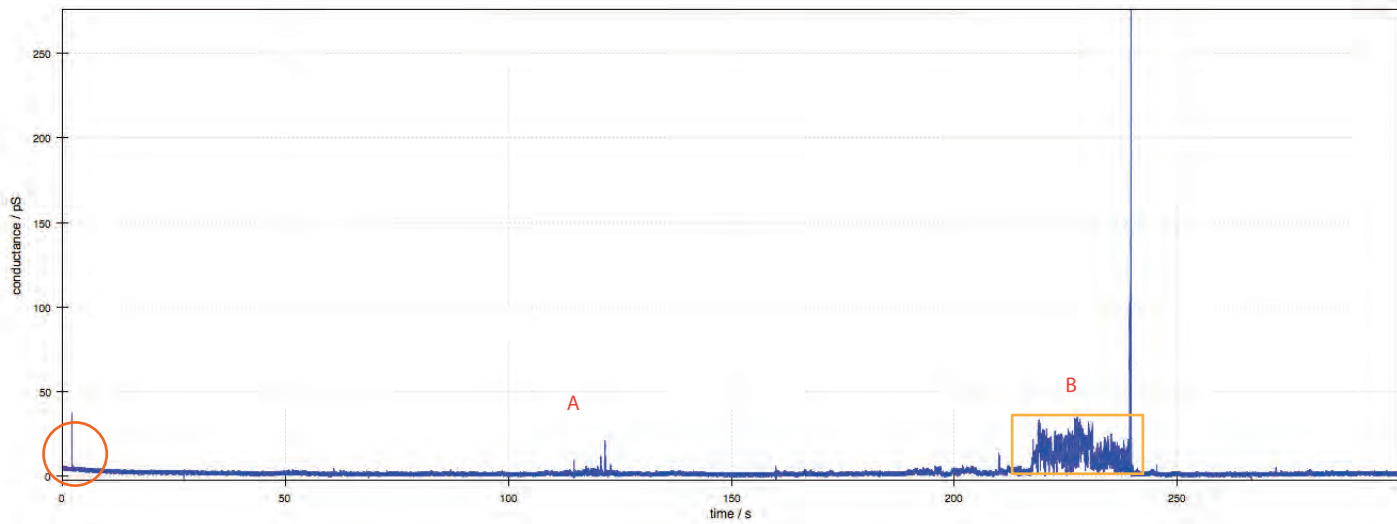
0009

87-0002

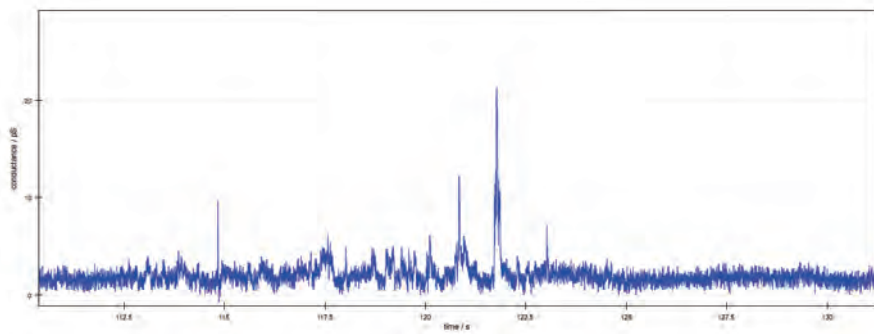


87-0002

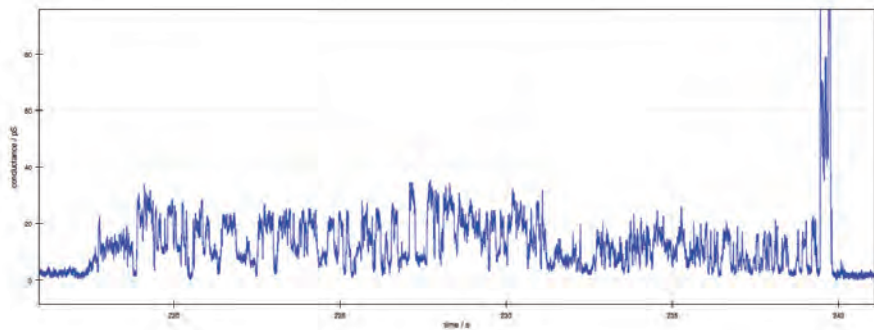




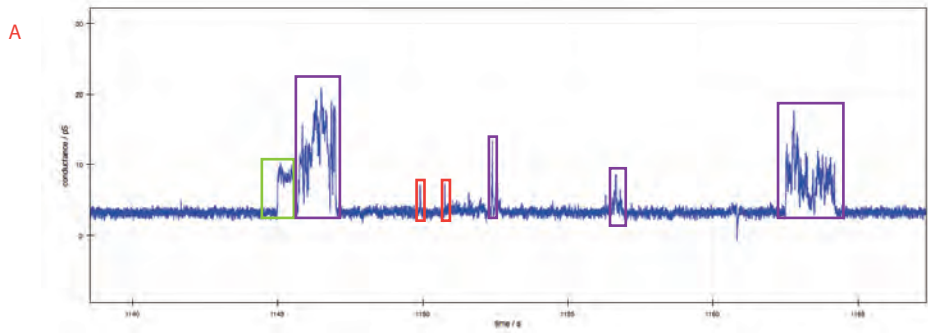
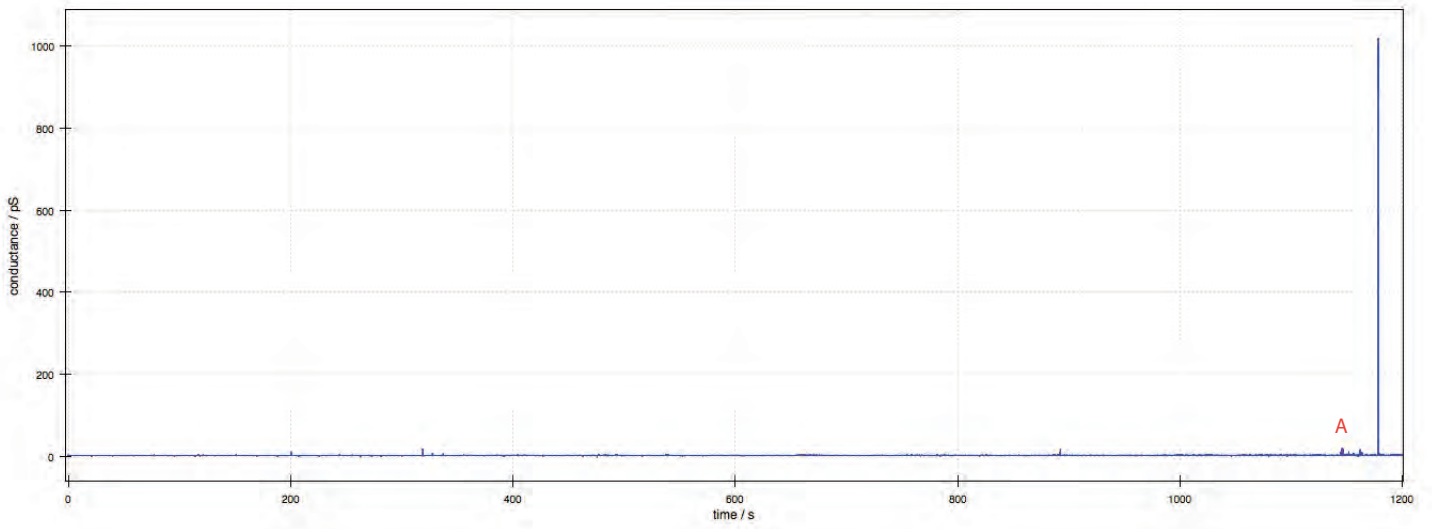
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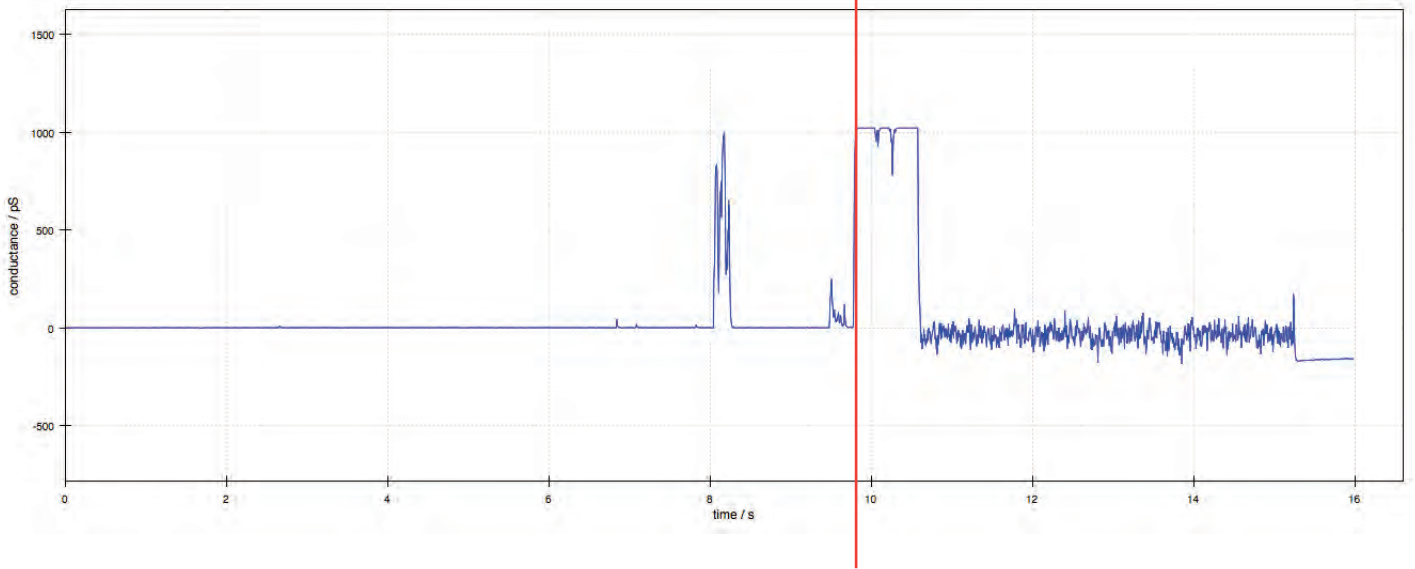
B



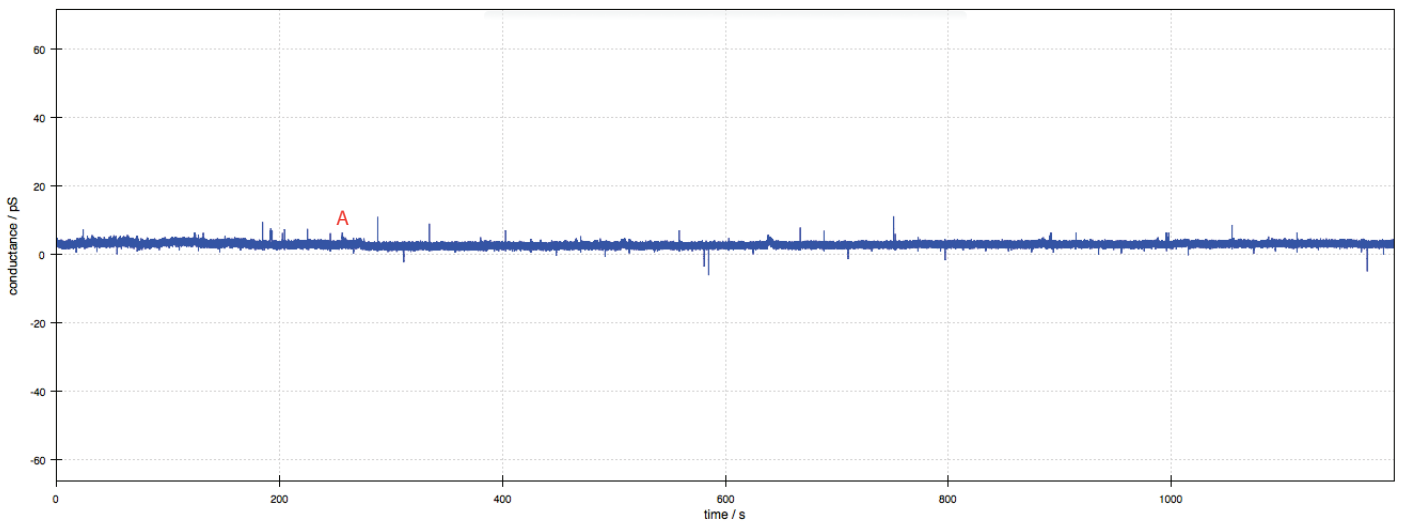
87-0005



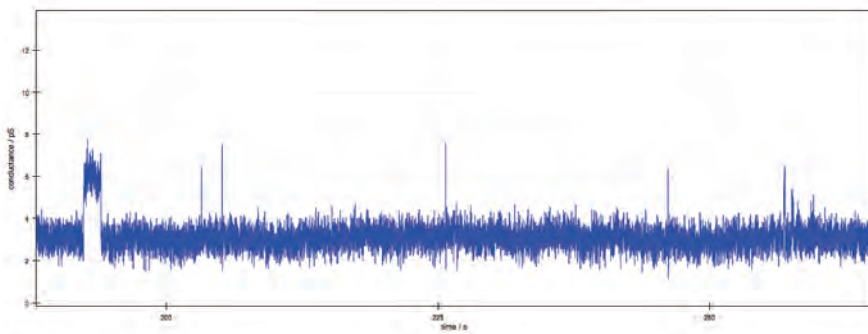
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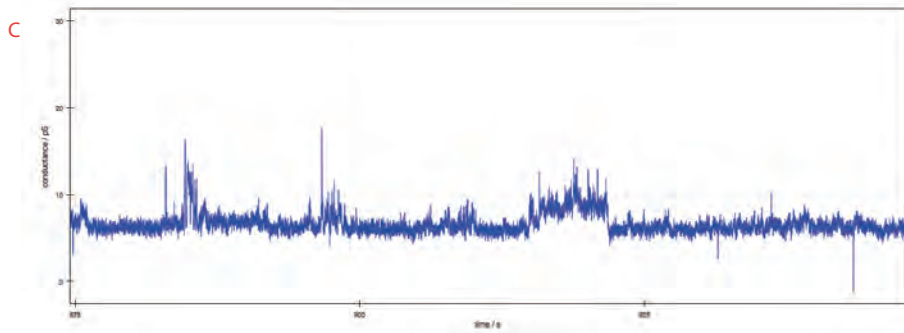
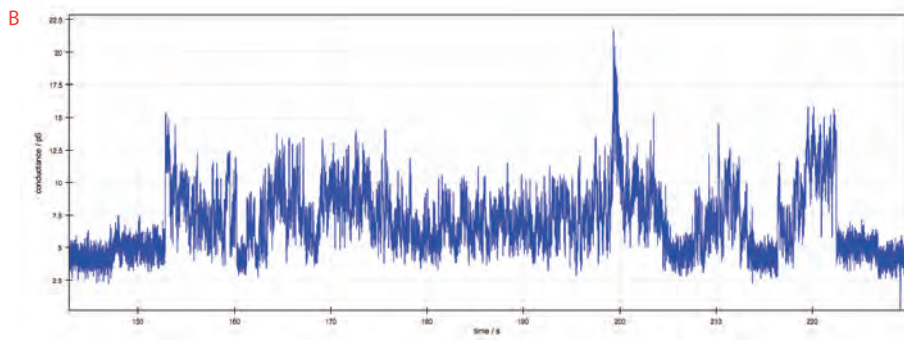
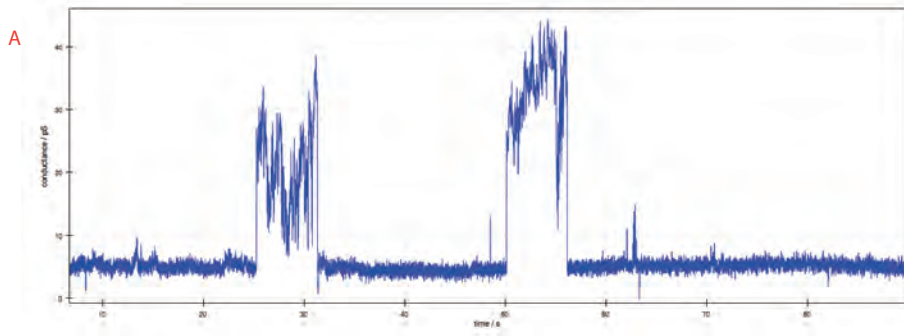
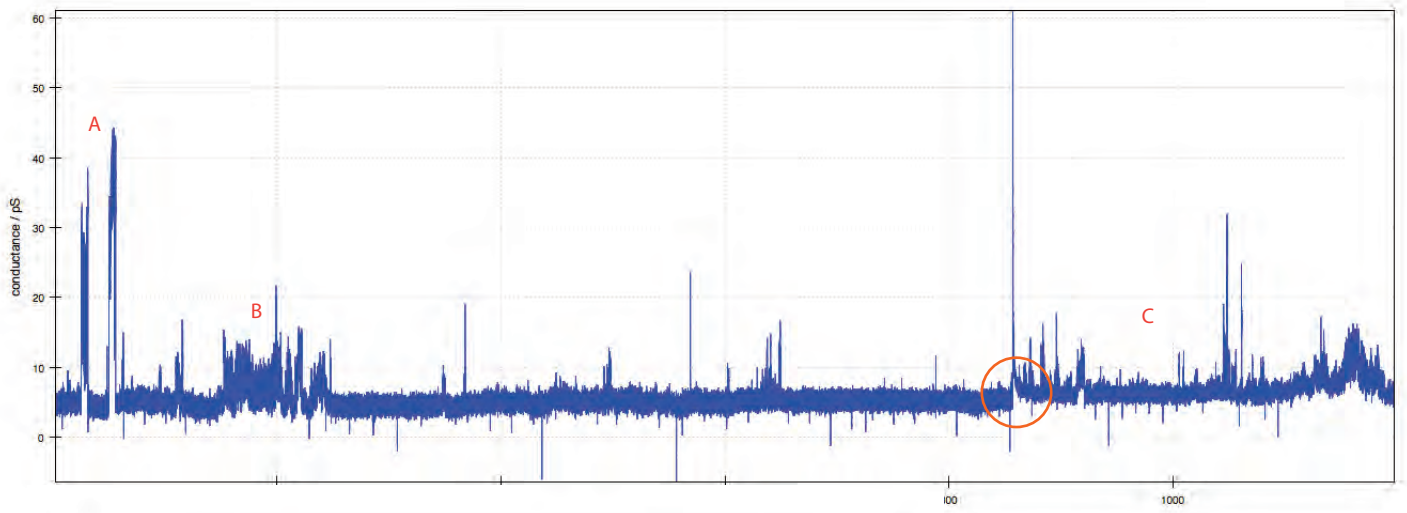


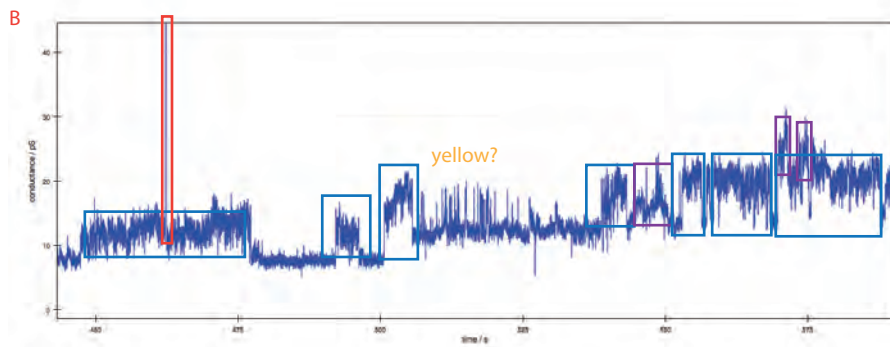
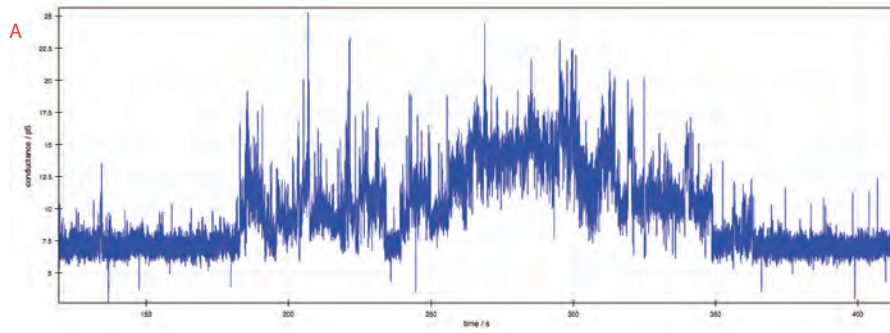
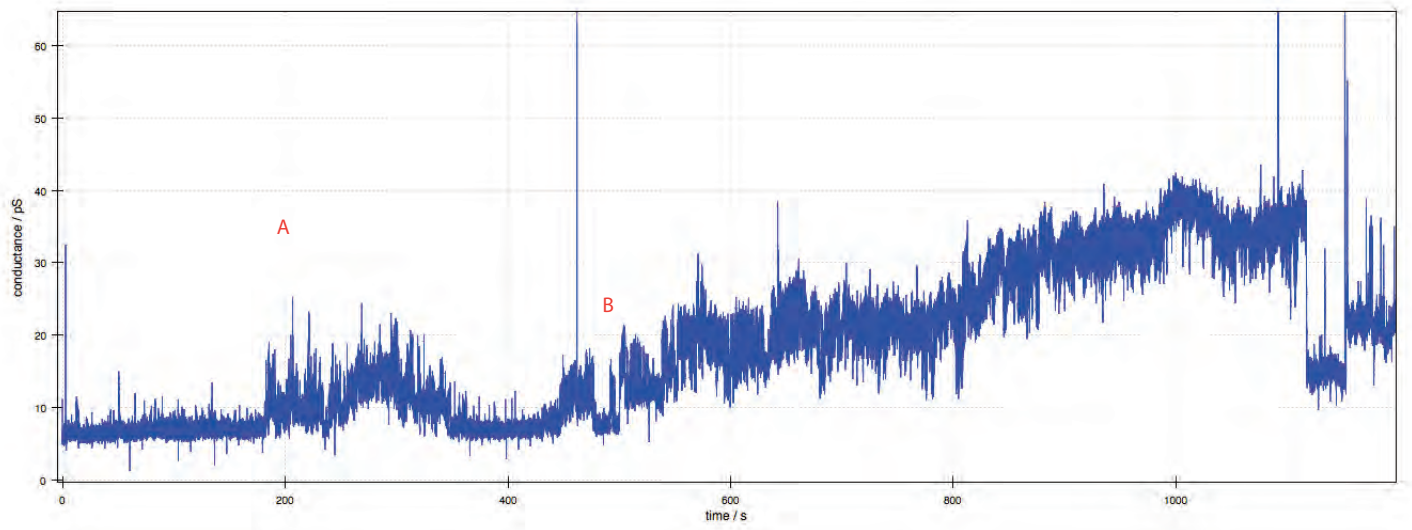
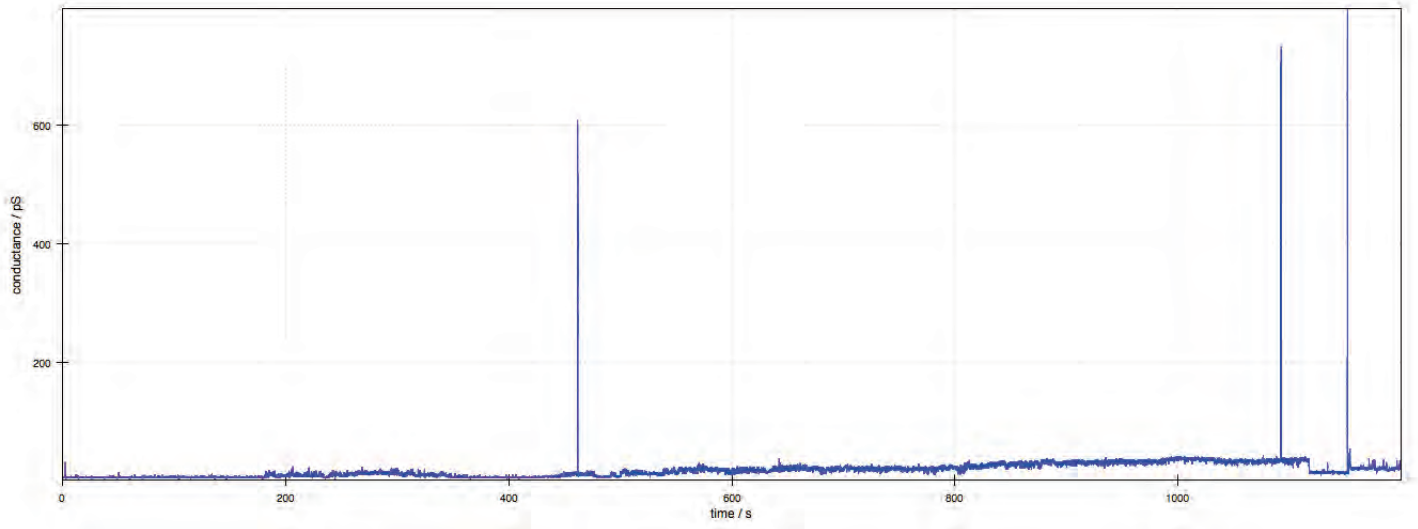
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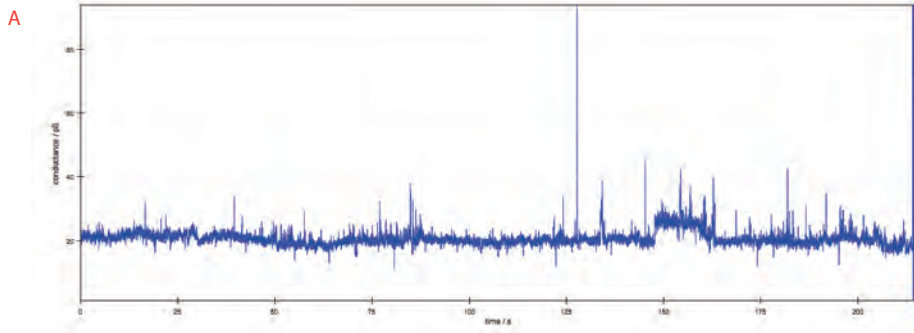
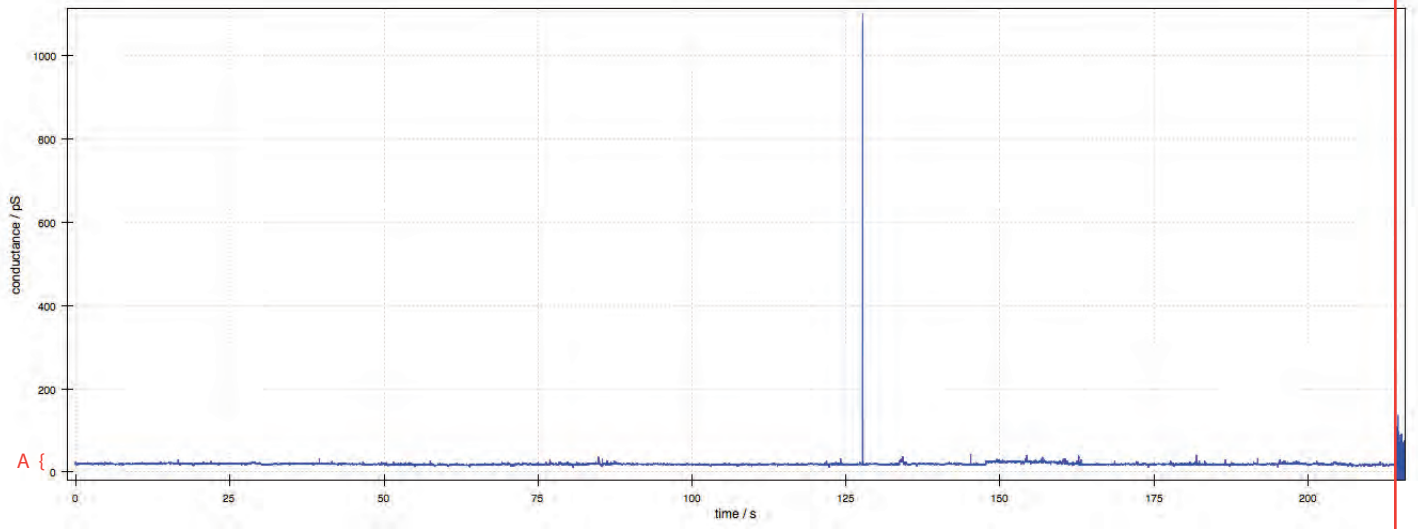


A

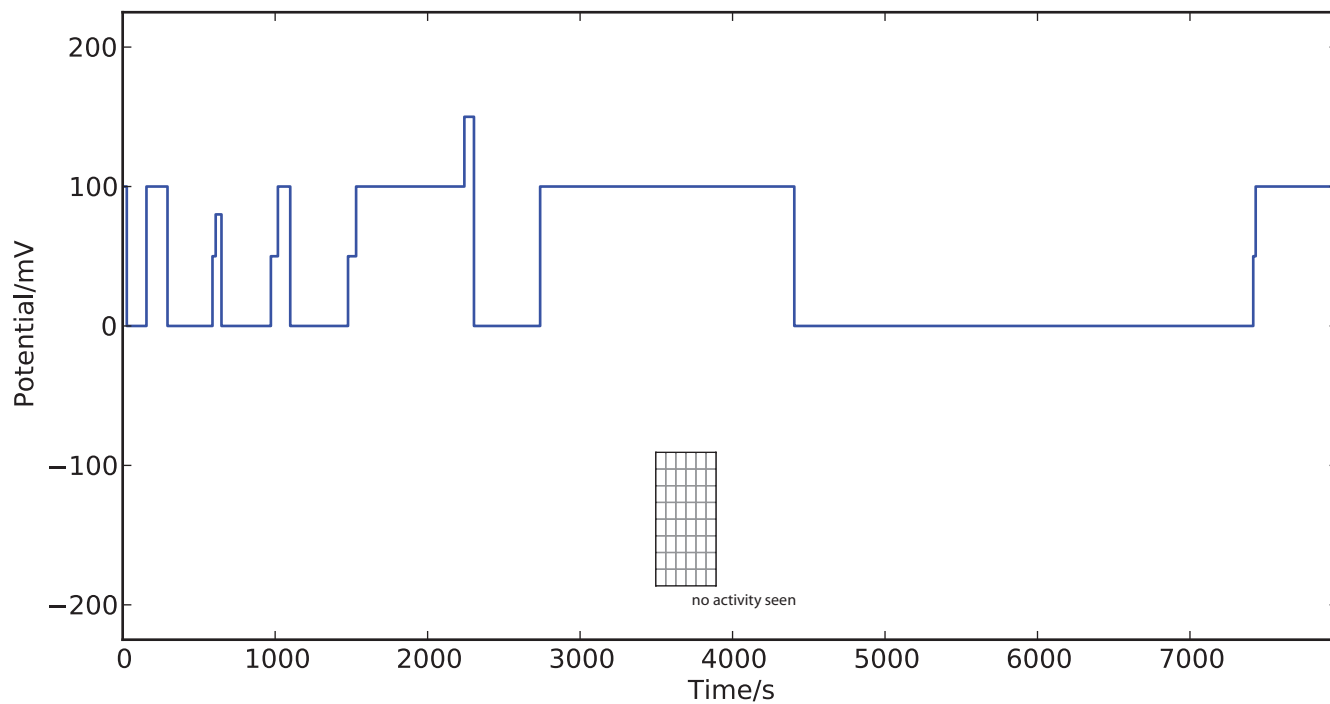






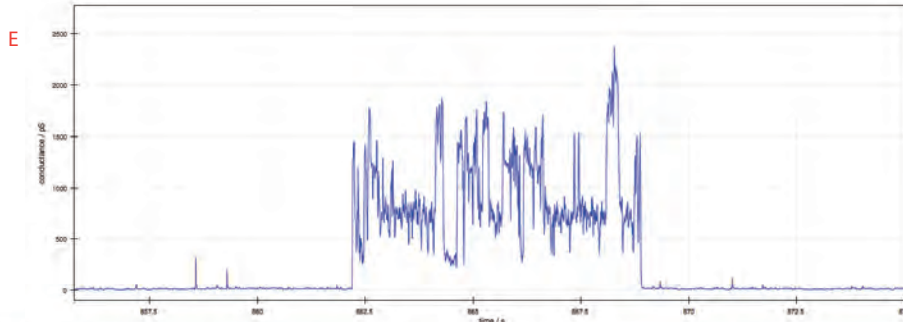
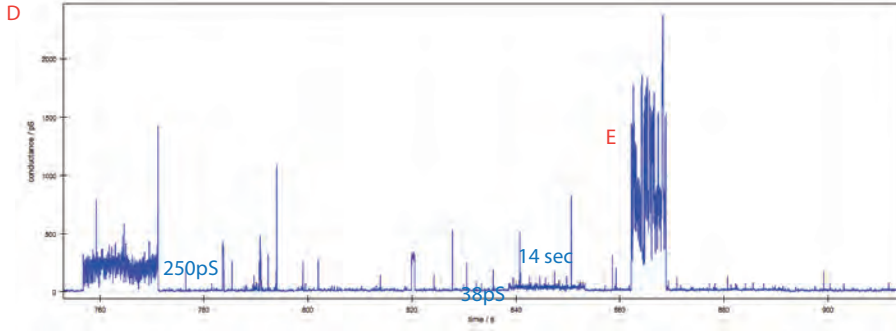


[JC-88] bCD6AmF4 1M CsCl pH 7 homoAdd CF3CH2OH (5-newDiPhPC)



lipid
electrolyte 28/19uM
contact injection
brush transfer

77/48uM total



see separate "assignment"

