

1              The Effect of Electric Fields on Bacterial Attachment to  
2              Conductive Surfaces

3

4              *Itai Gall, Moshe Herzberg, Yoram Oren\**

5

6

7              Zuckerberg Institute for Water Research,  
8              Ben-Gurion University of the Negev,  
9              Sede Boqer 84990, ISRAEL

10

11

12

13              **Supplementary Material**

14

15

16

17

18              **Revised version Submitted**

19              **to *Soft Matter* on December 7<sup>th</sup>, 2012**

20

21

22

23

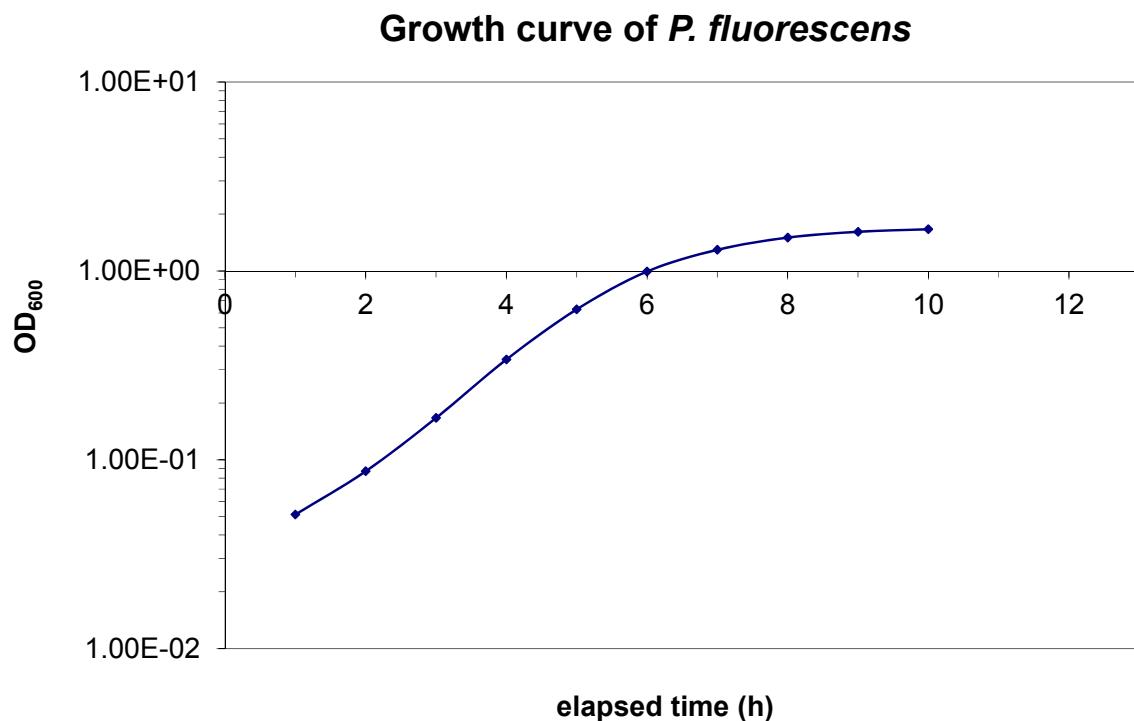
24

25

26              \* Corresponding author: [yoramo@bgu.ac.il](mailto:yoramo@bgu.ac.il)

27

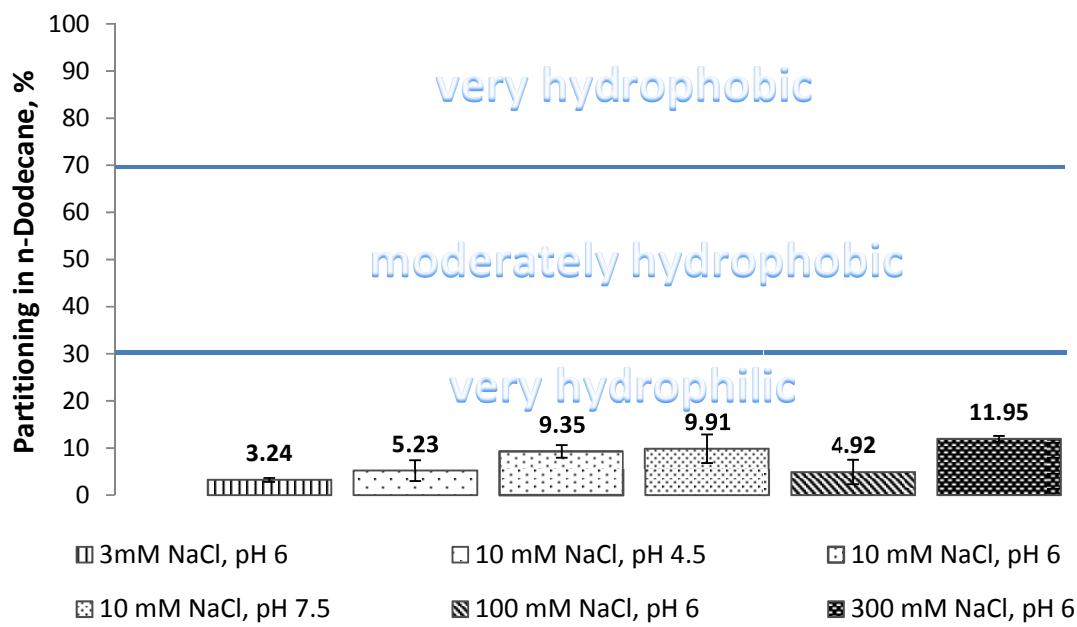
1



2

3 **Figure 1S:** Growth curve experiment for *Pseudomonas fluorescens* - The optical density at 600  
4 nm was measured by use of a spectrophotometer (Lambda EZ201) and plotted against elapsed  
5 time. The experiment covers the lag phase (until the 2<sup>nd</sup> hour), the exponential phase (until the 8<sup>th</sup>  
6 hour) and the beginning of the stationary phase of the bacterial growth cycle (after 8 hours).  
7 Each data point is an average reading taken from three independent cultures. The error bars are  
8 not visible since standard deviations were comparatively low.

1



2

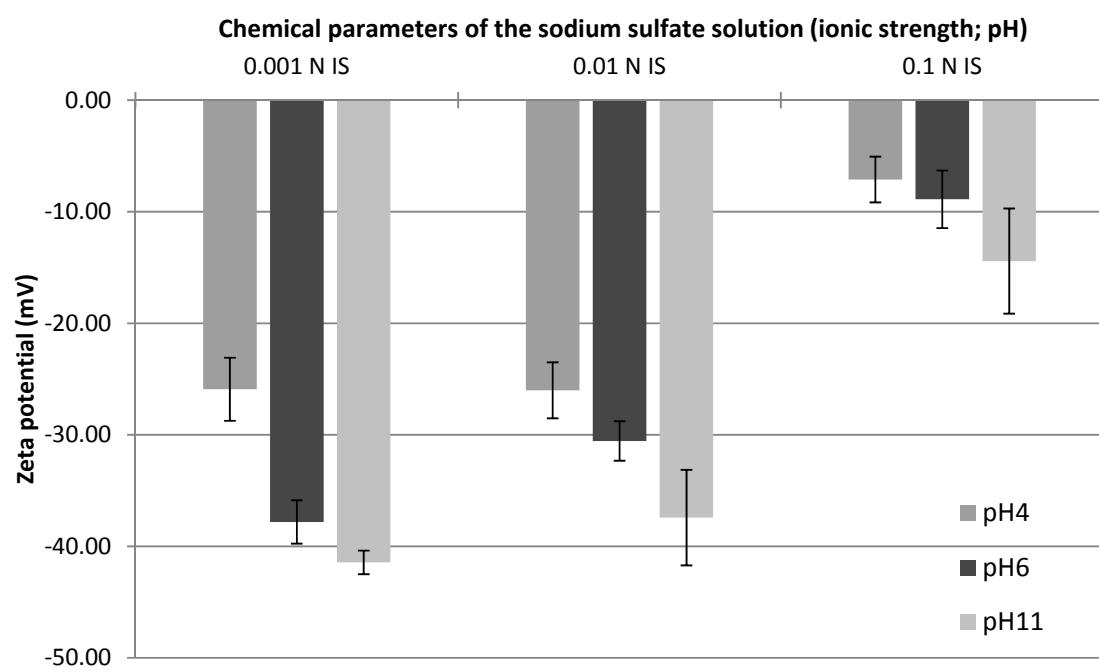
3

4

5

6 **Figure 2S:** Hydrophobicity for *P. fluorescens* measured by the MATH protocol. Measurement  
7 parameters and partitioning percentages are mentioned in the legend and above the bars  
8 respectively. The error bars represent one standard deviation.

1



2

3

4

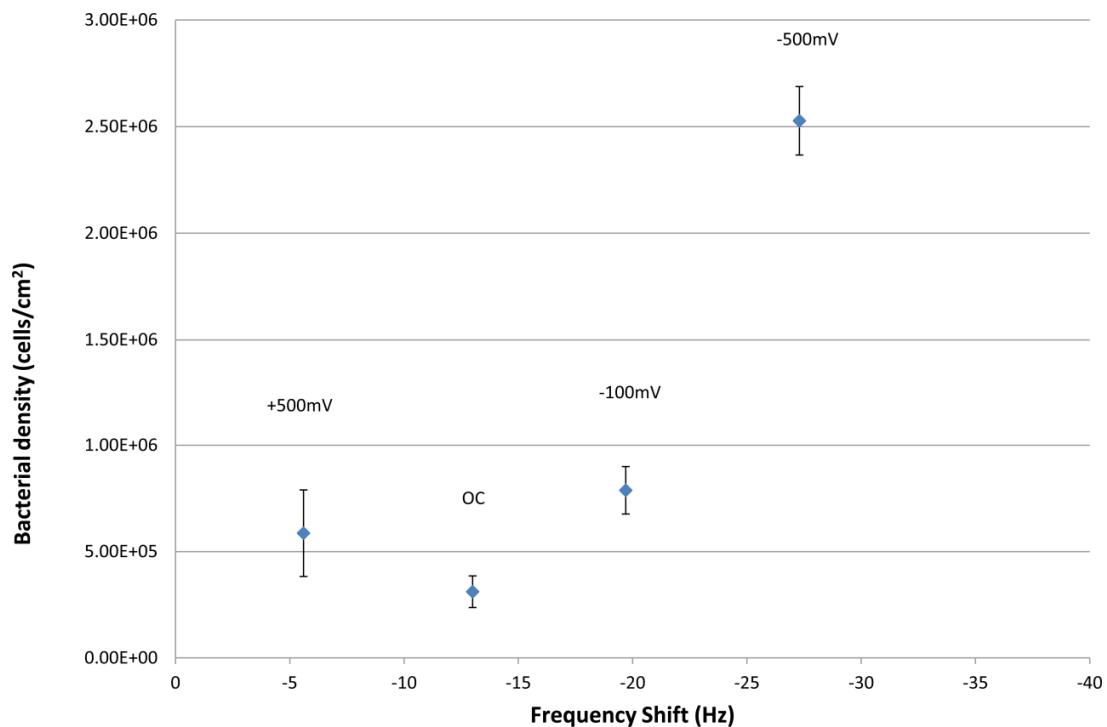
5

6

7 **Figure 3S:** Zeta potentials of *P. fluorescens* cells for different ionic strengths and pH of sodium sulfate solutions. The error bars represent one standard deviation of nine independent readings.

8

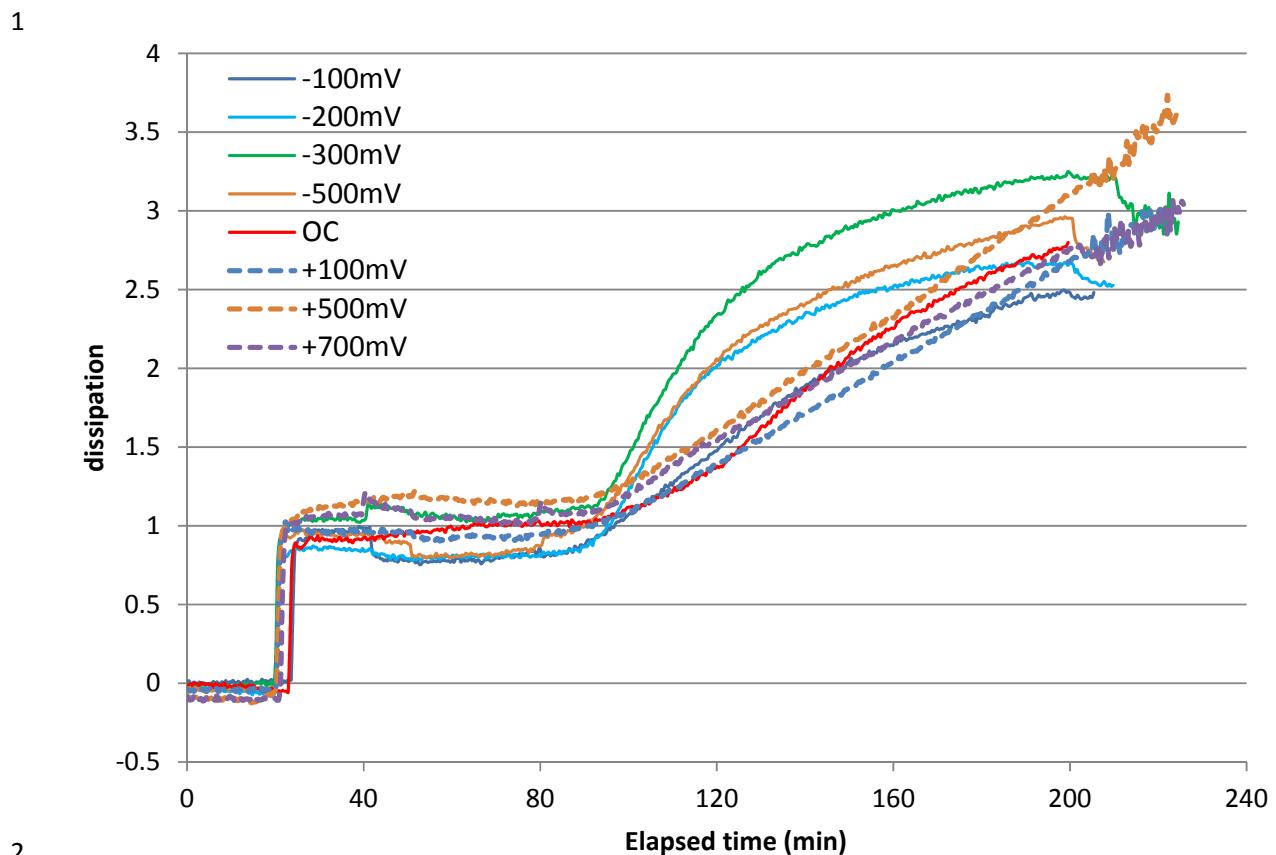
1



2

3

4 **Figure 4S:** : Bacterial density vs. frequency shift - at the end of four sample experiments and  
5 their repetition experiments, the sensor was photographed beneath a fluorescence microscope.  
6 The cell signals were counted, normalized by the area of the sensor to obtain the cell density and  
7 correlated to the measured final frequency shift. The standard deviations represent the data from  
8 three different photographs per experiment.



2

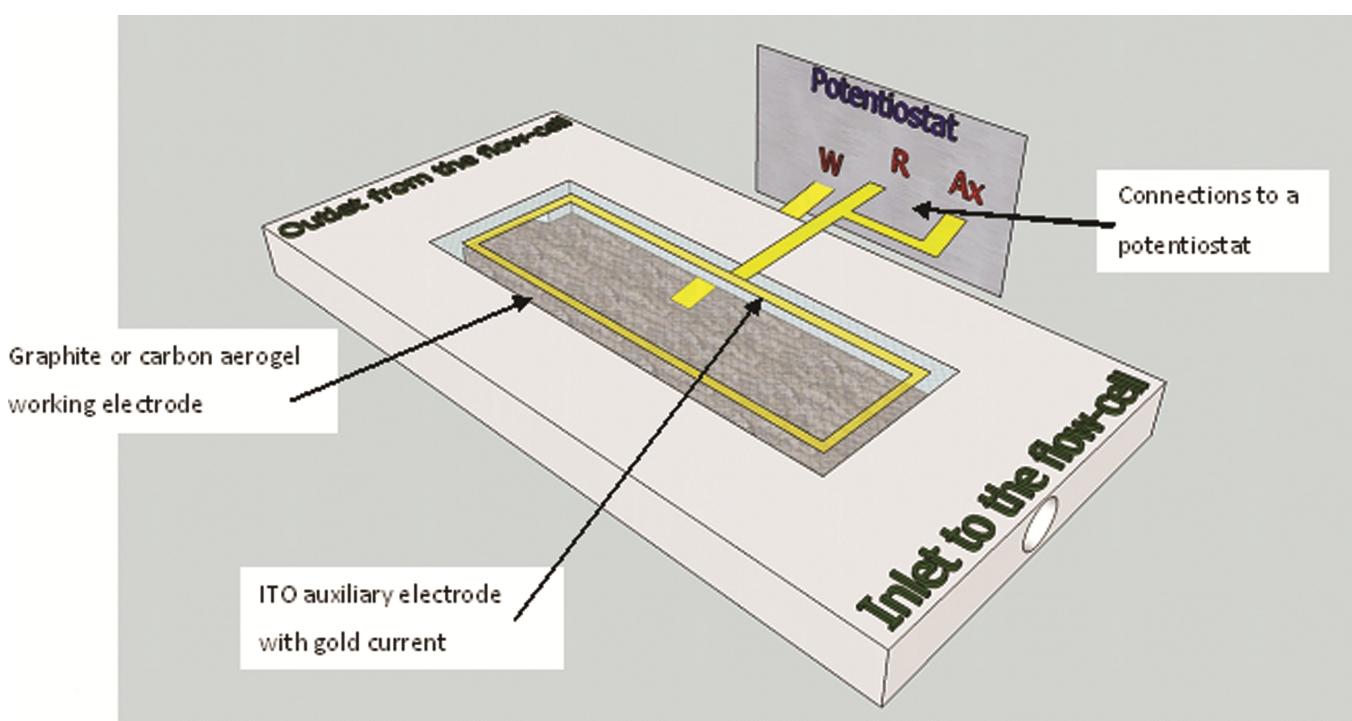
3

4

5

6 **Figure 5S:** Monitoring of the dissipation factor in QCMD experiments at different constant  
7 electric potentials (chronoamperometry). Electrical current measurements are not shown. Each  
8 experiment started at time index 80 minutes (x-axis). Before that time index, control experiments  
9 were carried out with pure electrolyte solution.

10



1

2

3 **Figure 6S:** Schematic view of the parallel plate flow-cell containing a working electrode (W) and a  
4 transparent ITO as an auxiliary (Ax) electrode used also as a reference (R).