

## Supporting Information

# All-Electrical Antibiotic Susceptibility and Resistance Profiling of Electrogenic *Pseudomonas aeruginosa*

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Table S1. Summary of the gold standard BMD and our AST results for GEM-susceptible *P. aeruginosa* with different gentamicin concentrations.

	AST	Antibiotic concentration					
		0 µg/ml	2 µg/ml	4 µg/ml	8 µg/ml	16 µg/ml	32 µg/ml
Standard BMD	Susceptible (S) /Resistant (R)	R	R	S	S	S	R
Our MFC-based AST array	S/R - 0.1 OD <sub>600</sub>	R	S	S	S	S	S
	S/R - 0.5 OD <sub>600</sub>	R	R	S	S	S	S
	S/R - 1.0 OD <sub>600</sub>	R	R	R	R	R	R

Table S2. Summary of the gold standard BMD and our AST results for GEM-resistant *P. aeruginosa* with different gentamicin concentrations.

	AST	Antibiotic concentration					
		2 µg/ml	4 µg/ml	8 µg/ml	16 µg/ml	32 µg/ml	64 µg/ml
Standard BMD	Susceptible (S) /Resistant (R)	R	R	R	R	R	R
Our MFC-based AST array	S/R - 0.1 OD <sub>600</sub>	R	R	R	R	R	R
	S/R - 0.5 OD <sub>600</sub>	R	R	R	R	R	R
	S/R - 1.0 OD <sub>600</sub>	R	R	R	R	R	R

Table S3. Summary of the gold standard BMD and our AST results for CIP -susceptible *P. aeruginosa* with different ciprofloxacin concentrations.

	AST	Antibiotic concentration					
		0 µg/ml	0.25 µg/ml	0.5 µg/ml	1.0 µg/ml	1.5 µg/ml	2.0 µg/ml
Standard BMD	Susceptible (S) /Resistant (R)	R	R	S	S	S	S
Our MFC-based AST array	S/R - 0.1 OD <sub>600</sub>	R	S	S	S	S	S
	S/R - 0.5 OD <sub>600</sub>	R	S	S	S	S	S
	S/R - 1.0 OD <sub>600</sub>	R	R	R	R	R	R

Table S4. Summary of the gold standard BMD and our AST results for CIP - resistant *P. aeruginosa* with different ciprofloxacin concentrations.

	AST	Antibiotic concentration					
		0.25 µg/ml	0.5 µg/ml	1 µg/ml	1.5 µg/ml	2 µg/ml	4 µg/ml
Standard BMD	Susceptible (S) /Resistant (R)	R	R	R	R	R	R
Our MFC-based AST array	S/R – 0.1 OD <sub>600</sub>	R	R	R	R	R	R
	S/R – 0.5OD <sub>600</sub>	R	R	R	R	R	R
	S/R – 1.0 OD <sub>600</sub>	R	R	R	R	R	R

Table S5. Summary of the gold standard BMD and our AST results for AMP - susceptible *P. aeruginosa* with different ampicillin concentrations.

	AST	Antibiotic concentration		
		0 µg/ml	50 µg/ml	100 µg/ml
Standard BMD	Susceptible (S) /Resistant (R)	R	R	R
Our MFC-based AST array	S/R - 0.1 OD <sub>600</sub>	R	R	S
	S/R - 0.5 OD <sub>600</sub>	R	R	R
	S/R - 1.0 OD <sub>600</sub>	R	R	R

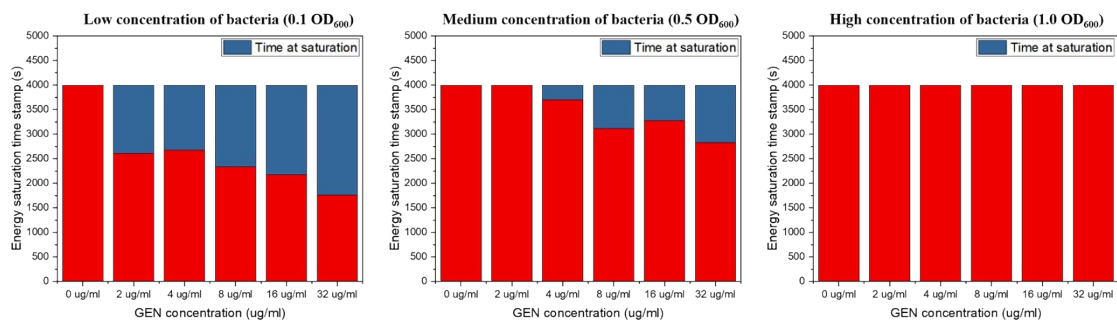
Table S6. Summary of the gold standard BMD and our AST results for AMP -resistant *P. aeruginosa* with different ampicillin concentrations.

	AST	Antibiotic concentration					
		25 µg/ml	50 µg/ml	75 µg/ml	100 µg/ml	125 µg/ml	150 µg/ml
Standard BMD	Susceptible (S) /Resistant (R)	R	R	R	R	R	R
Our MFC-based AST array	S/R – 0.1 OD <sub>600</sub>	R	R	R	R	R	R
	S/R – 0.5OD <sub>600</sub>	R	R	R	R	R	R
	S/R – 1.0 OD <sub>600</sub>	R	R	R	R	R	R

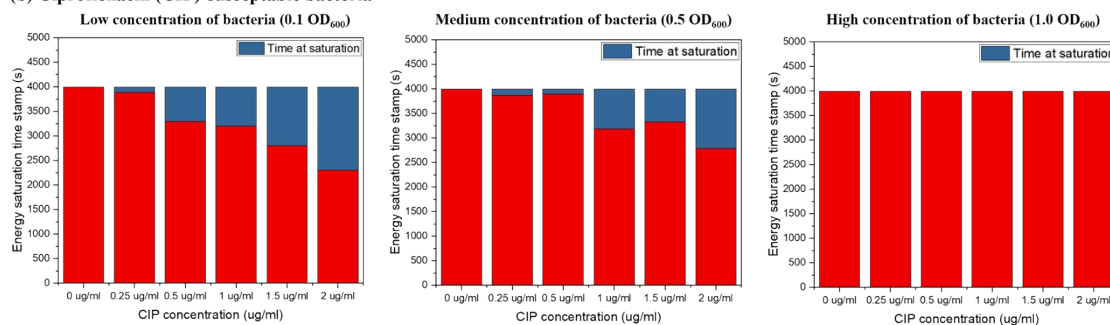
Table S7. Minimum inhibitory concentrations (MICs) of antibiotics against *P. aeruginosa* biofilm with different concentrations.

Concentration of <i>P. aeruginosa</i>	Gentamicin (GEM)	Ciprofloxacin (CIP)	Ampicillin (AMP)
0.1 OD <sub>600</sub>	2 µg/ml	0.25 µg/ml	100 µg/ml
0.5 OD <sub>600</sub>	4 µg/ml	0.25 µg/ml	Resistant
1.0 OD <sub>600</sub>	Resistant	Resistant	Resistant

**(a) Gentamicin (GEM)-susceptible bacteria**



**(b) Ciprofloxacin (CIP)-susceptible bacteria**



**(c) Ampicillin (Amp)-susceptible bacteria**

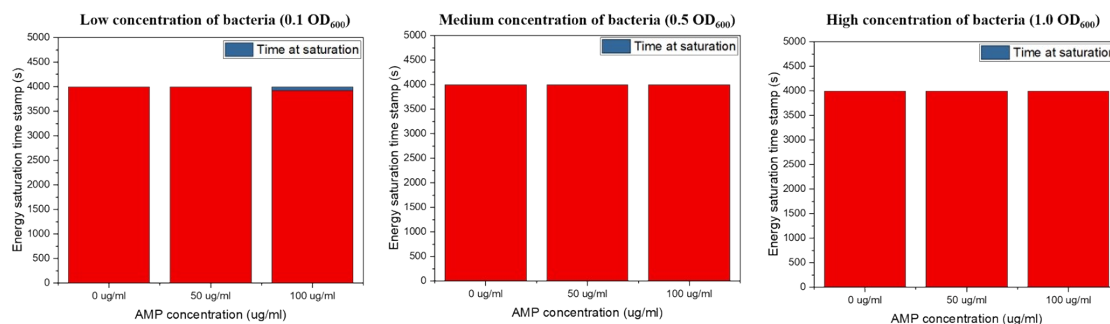


Figure S1: Bar graph showing the time required to reach the plateau of antibiotic-susceptible *P. aeruginosa* treated with (a) Gentamicin, (b) Ciprofloxacin, and (c) Ampicillin. The values are calculated from Figure 5. The red bars represent ineffective antibiotics, while the blue bars indicate higher susceptibility.

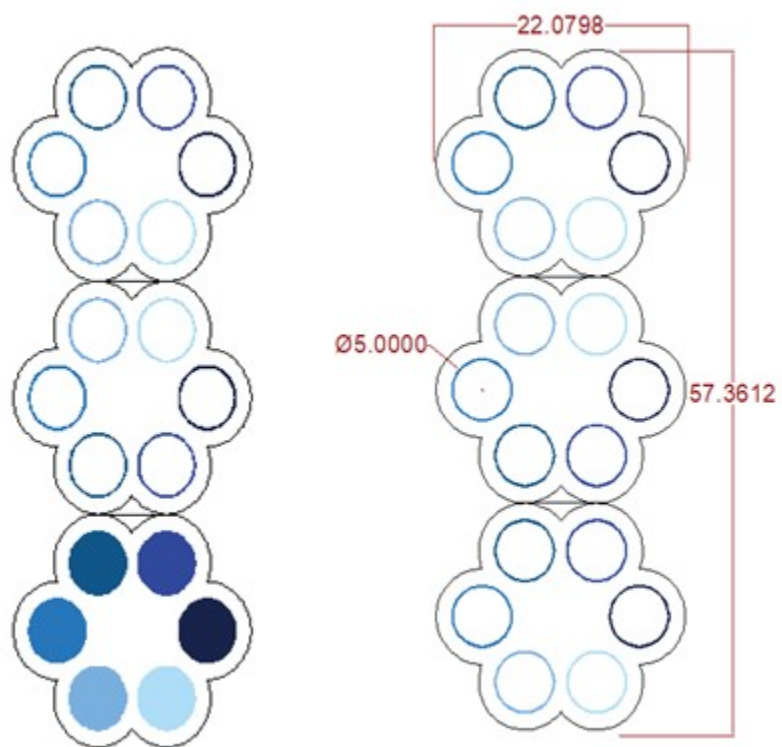


Figure S2. Designs and dimensions of the single-sheet paper AST array (Unit: mm).

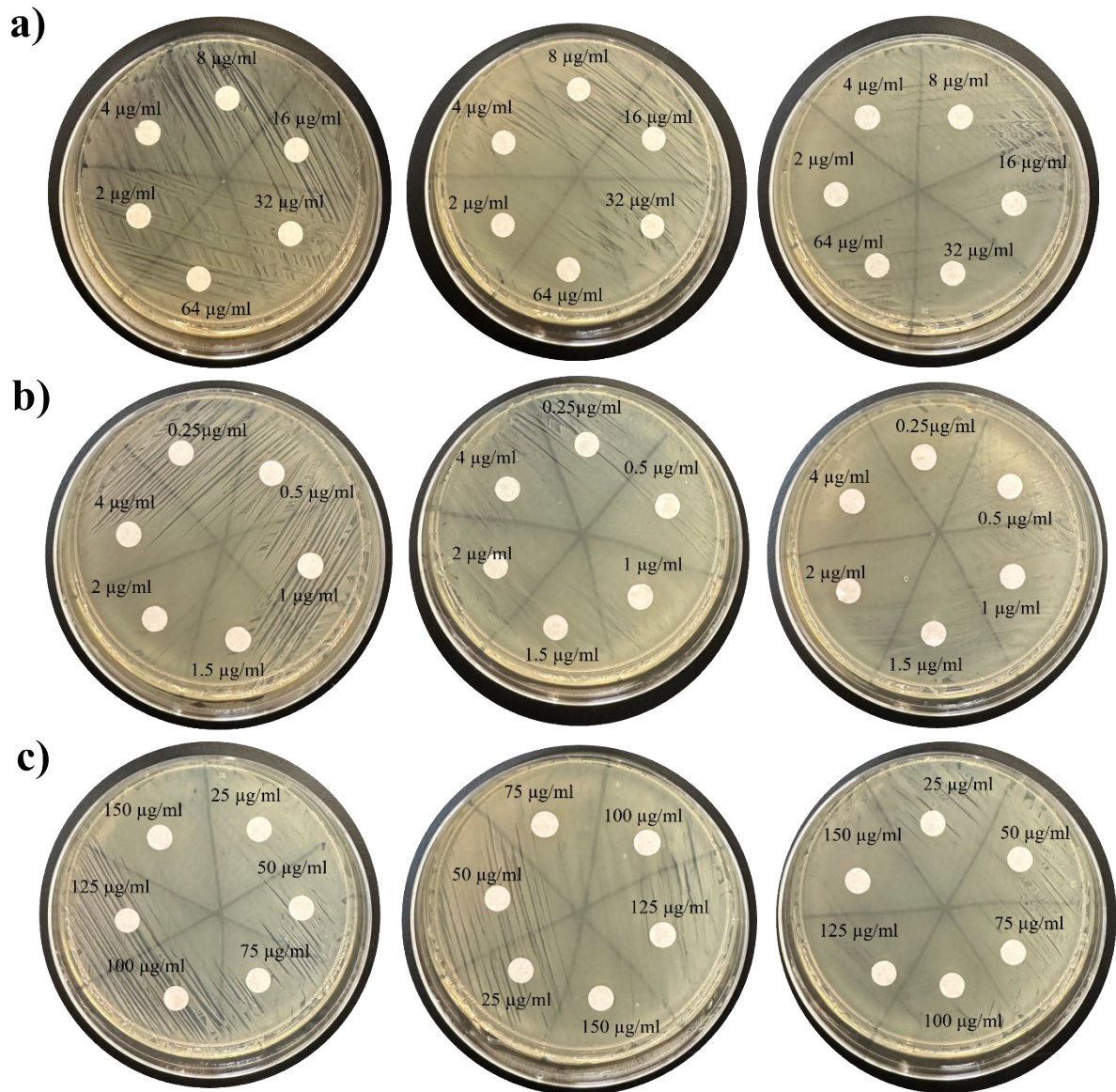


Figure S3. Agar plate test of antibiotic-resistance *P. Aeruginosa* for a) GEM, b) CIP, and c) AMP antibiotic at different concentrations of antibiotics for OD<sub>600</sub> 0.1, 0.5, and 1 from left to right.