

Supporting Information

Laser-Induced Graphene-PVA Composites as Robust Electrically Conductive Water Treatment Membranes

Amit K. Thakur,[†] Swatantra P. Singh,^{†‡} Maurício Nunes Kleinberg, Abhishek Gupta and
Christopher J. Arnusch^{*}

Department of Desalination and Water Treatment, Zuckerberg Institute for Water Research, The
Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Sede-Boqer
Campus, Midreshet Ben Gurion, 84990, Israel

[‡]Center for Environmental Science and Engineering (CESE), Indian Institute of Technology
Bombay, Powai, Mumbai 400076, India

[†]Authors with equal contribution

***Corresponding author:** Dr. C. J. Arnusch, arnusch@bgu.ac.il

Table S1. Membrane performance for LIG control membrane.

Parameters	Values
Water flux (LMH bar ⁻¹)	24801±18
BSA adsorption (%)	2.5±0.4
BSA rejection (%)	3.9±1.3
Bacteria removal (%)	18.3±4.9

Table S2. Membrane performance for LIG-PVA-0.5 and LIG-PVA-4 membranes before and after 1 hour sonication.

□

Parameters	LIG-PVA-0.5	LIG-PVA-4
Before sonication		
Water flux (LMH bar ⁻¹)	5569±28	222.8±10.5
BSA rejection (%)	9.7±1.5	61.8±1.2
After sonication		
Water flux (LMH bar ⁻¹)	5484±27	219.7±10.6
BSA rejection (%)	9.5±1.9	60.9±1.4

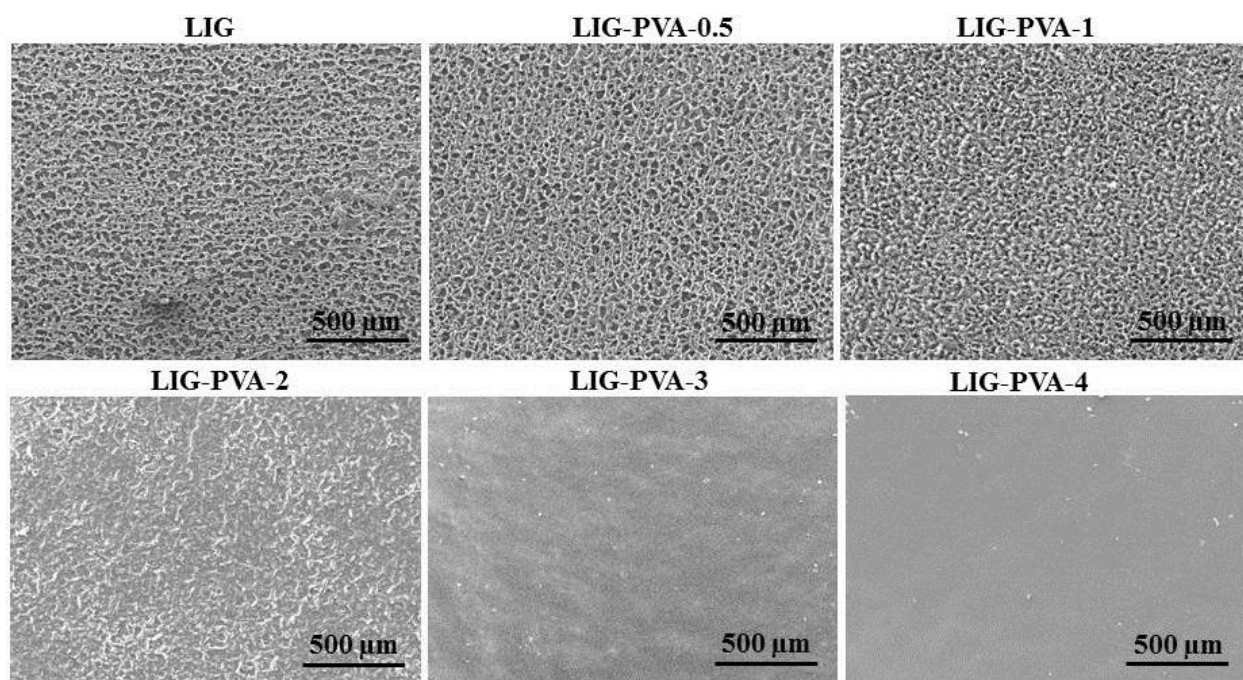


Figure S1. SEM images of different LIG-PVA composite membranes at low magnification.

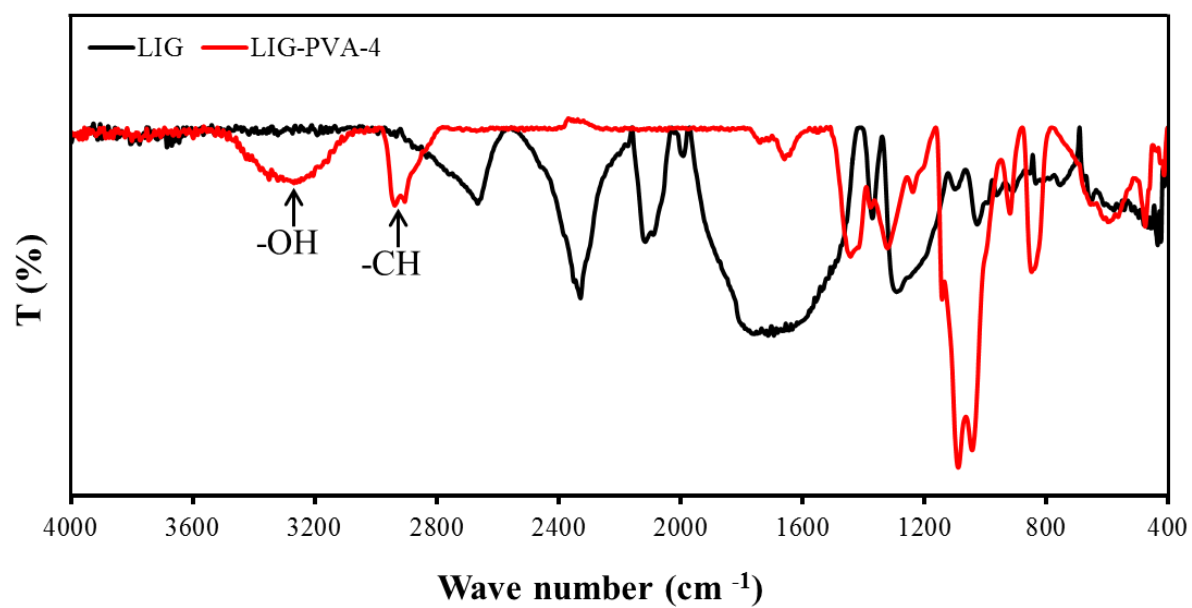


Figure S2. FTIR spectra of LIG (black line) and LIG-PVA-4 membrane (red line).

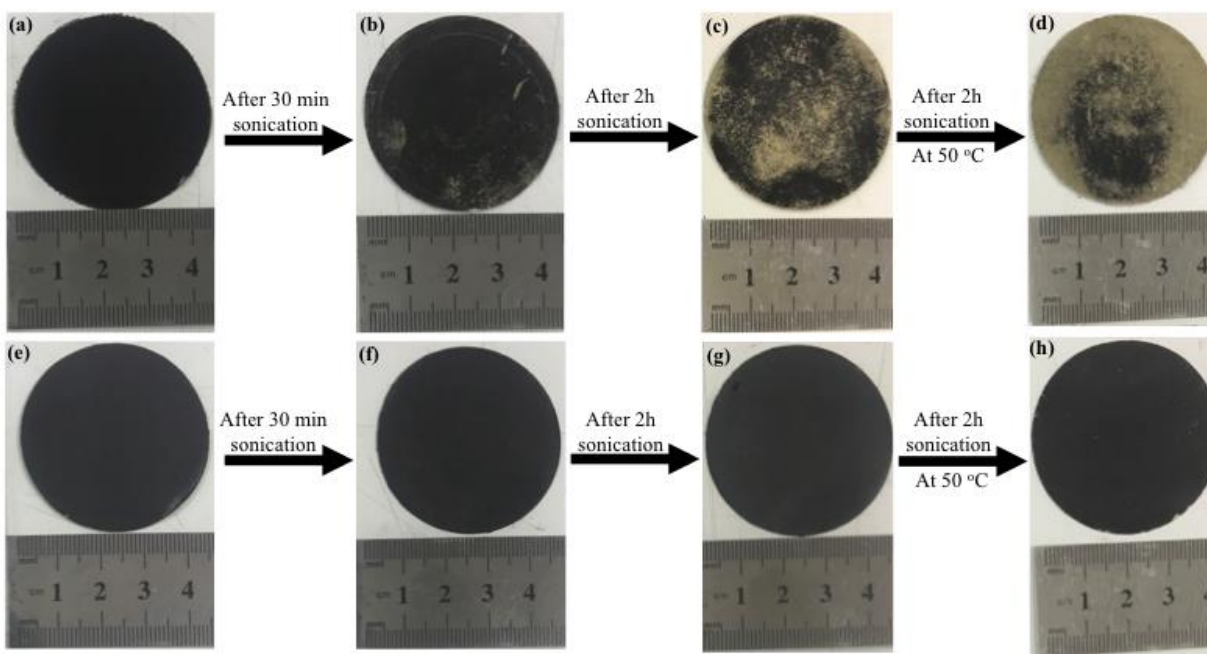


Figure S3. Stability tests. LIG substrate (a) before sonication, (b) after 30 min sonication, (c) after an additional 2h sonication, and (d) after an additional 2h sonication at 50 °C. LIG-PVA-0.5 membrane (e) before sonication, (f) after 30 min sonication, (g) after an additional 2h sonication, and (h) after an additional 2h sonication at 50 °C.

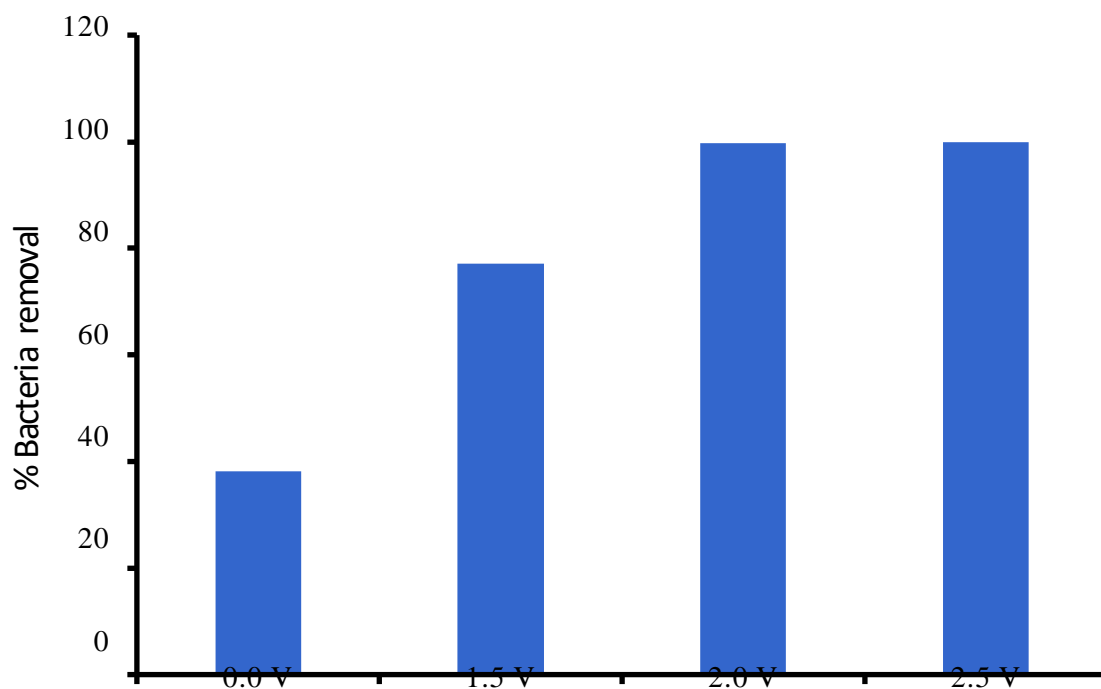


Figure S4. Percentage removal of the bacterial cells by the LIG-PVA-0.5 membrane with increasing applied voltage.